

gmc_trans: Sivers asymmetries and hadron distributions

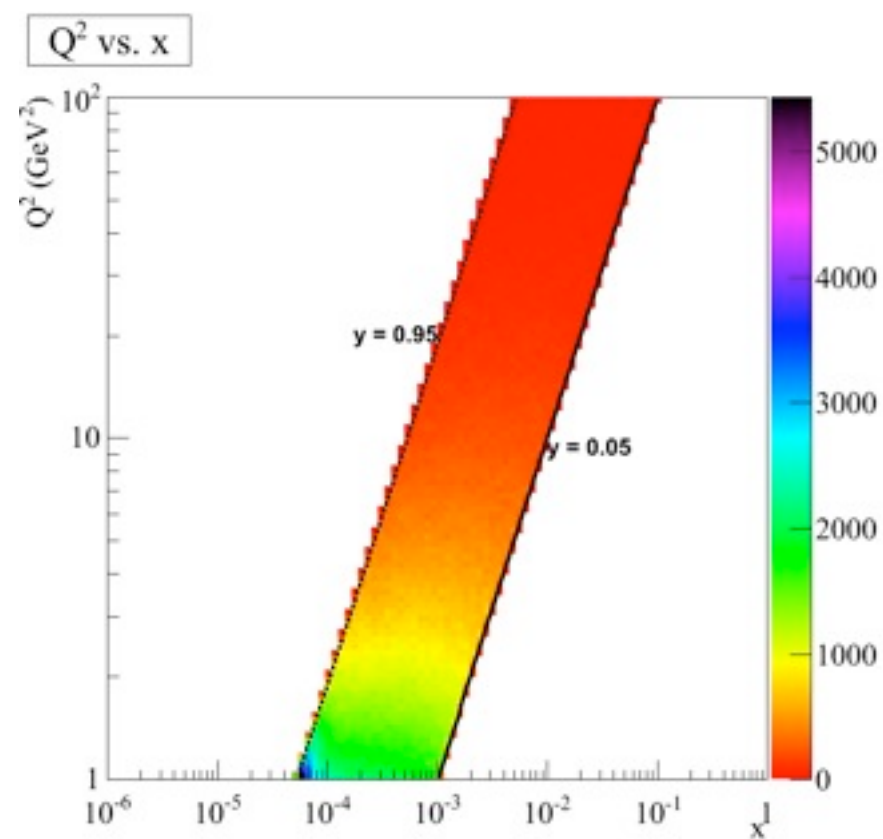
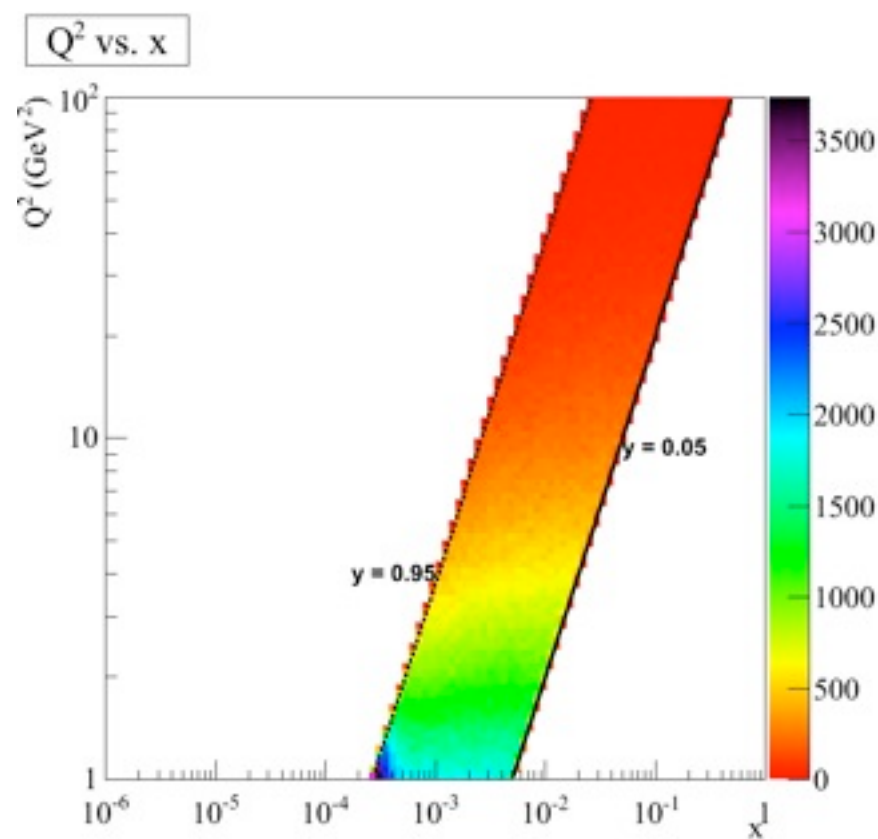
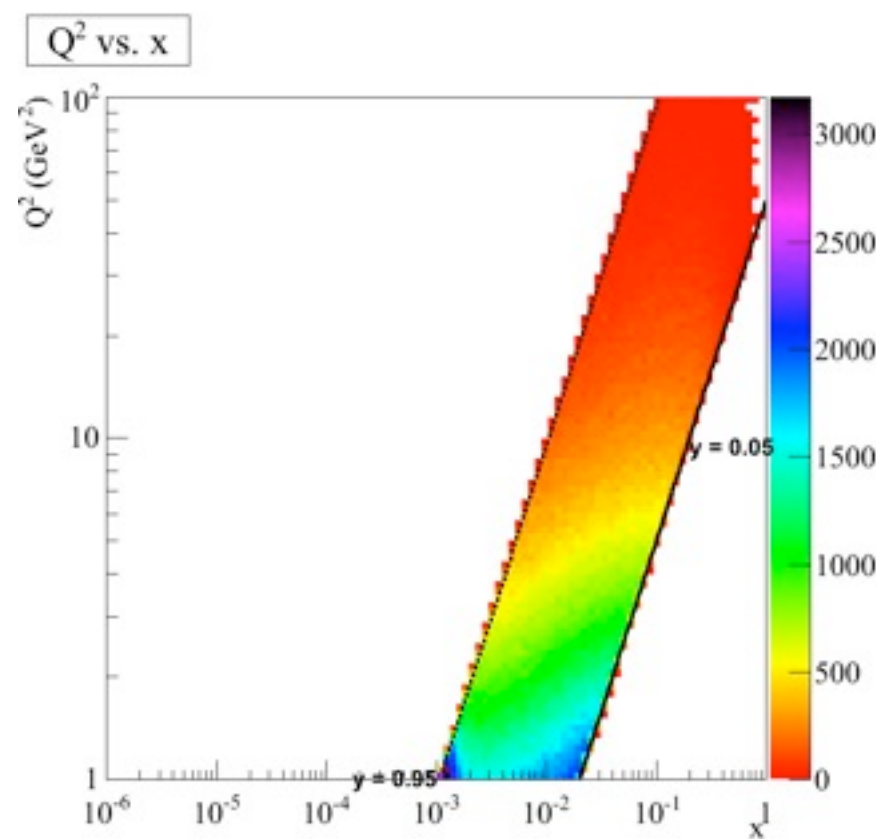
EIC Task force meeting
14th October 2010
Thomas Burton

Q^2 vs. x

5 x 50

10 x 100

20 x 250

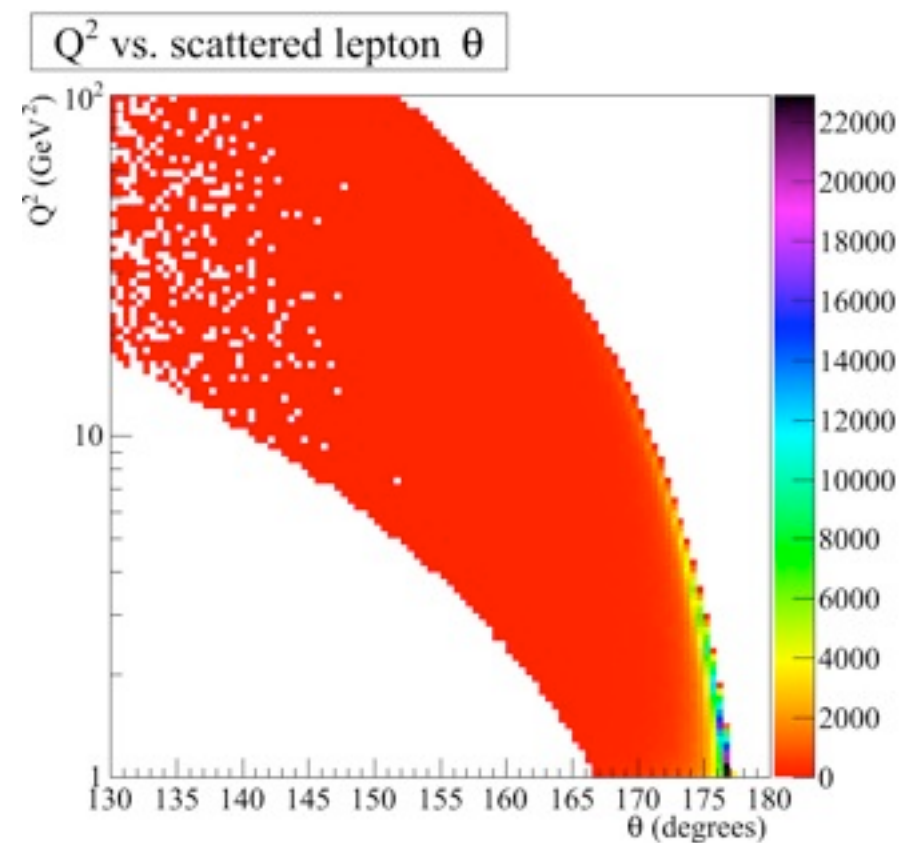
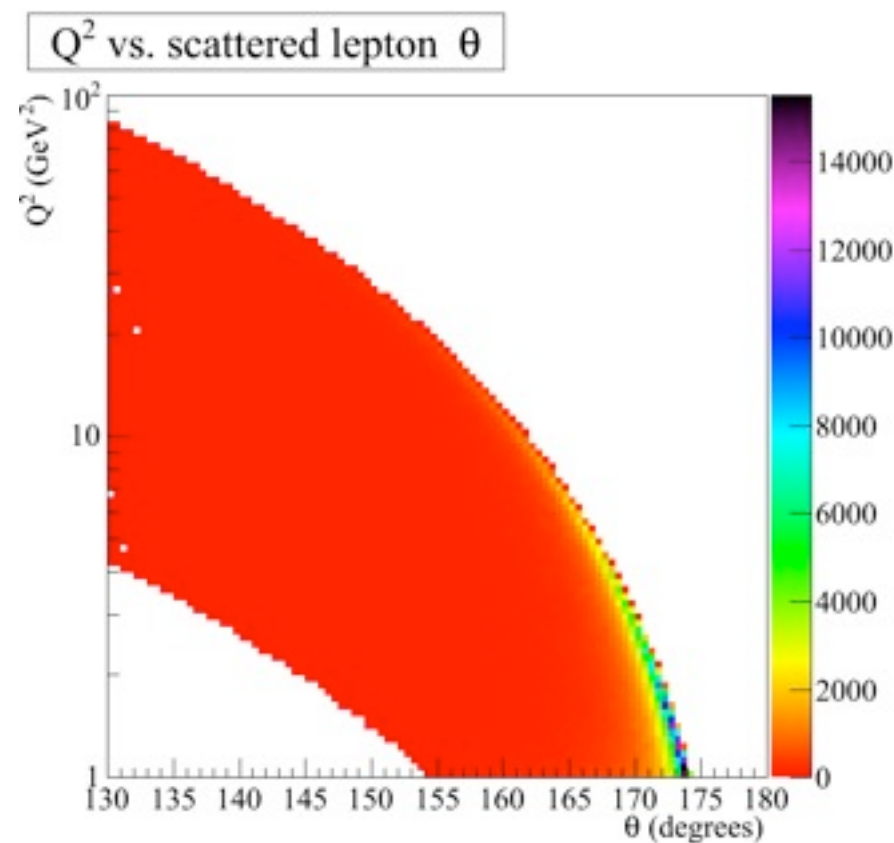
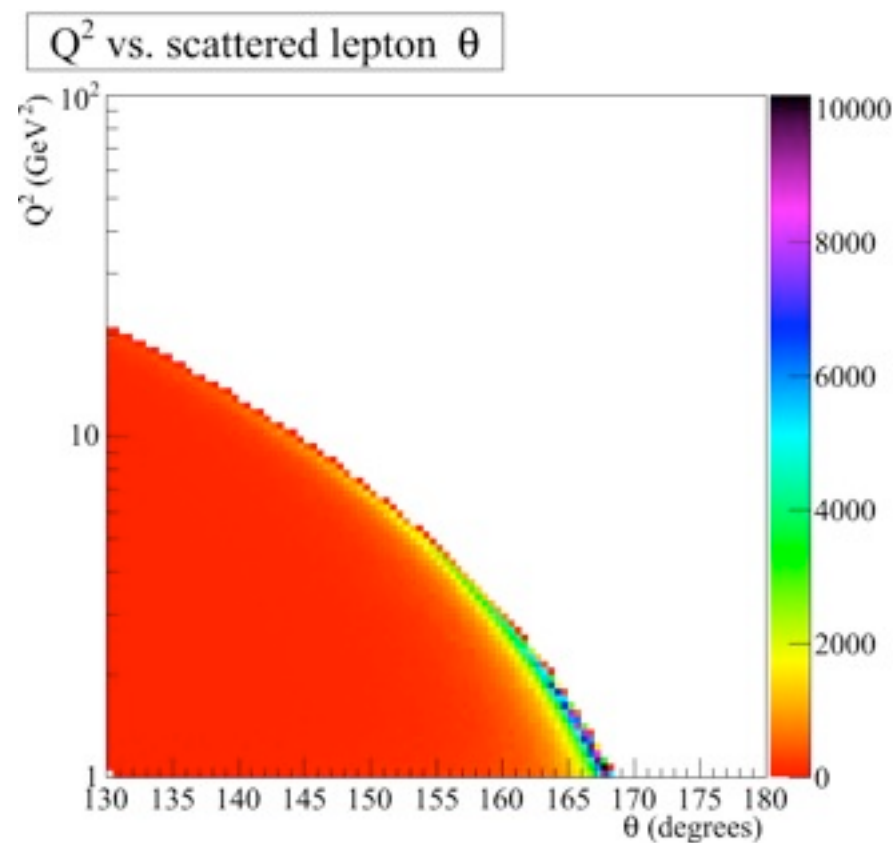


Q^2 vs. lepton θ

5 x 50

10 x 100

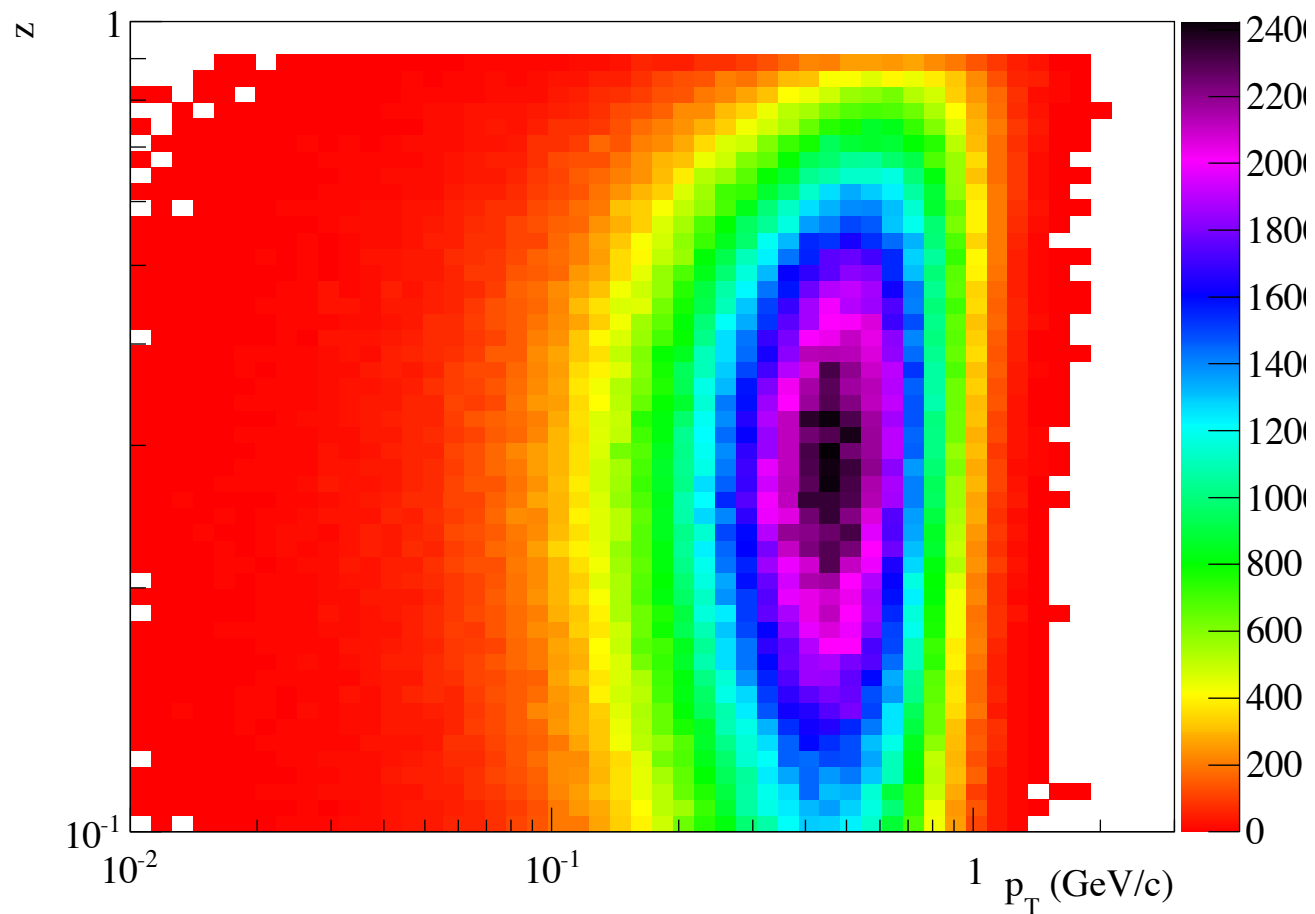
20 x 250



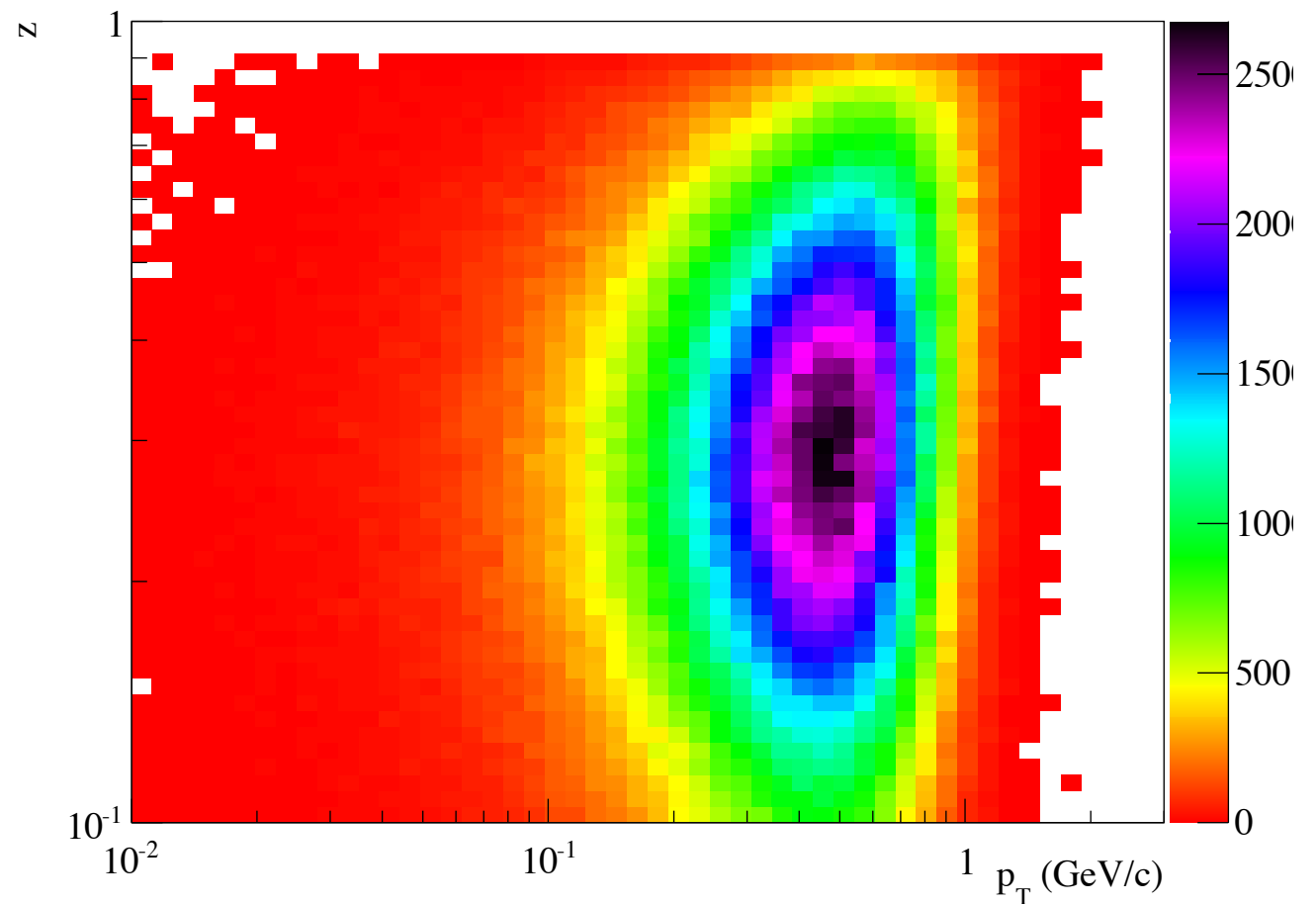
- $\theta = 0$ is incident proton beam direction
- $\theta = 180$ is incident electron beam direction

z vs. p_T @ 5 x 50

z vs. p_T (GeV/c), π^+

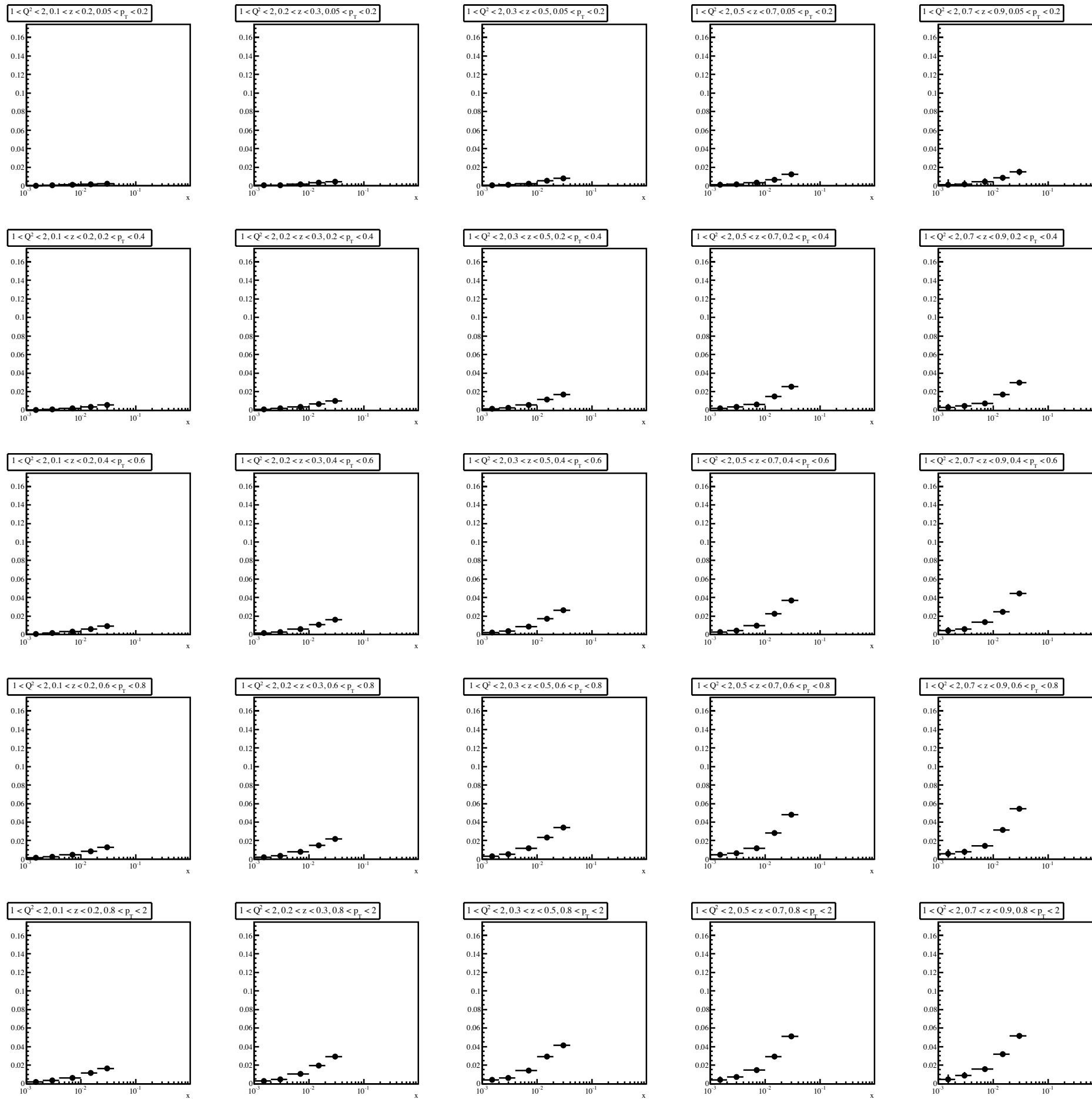


z vs. p_T (GeV/c), K^+



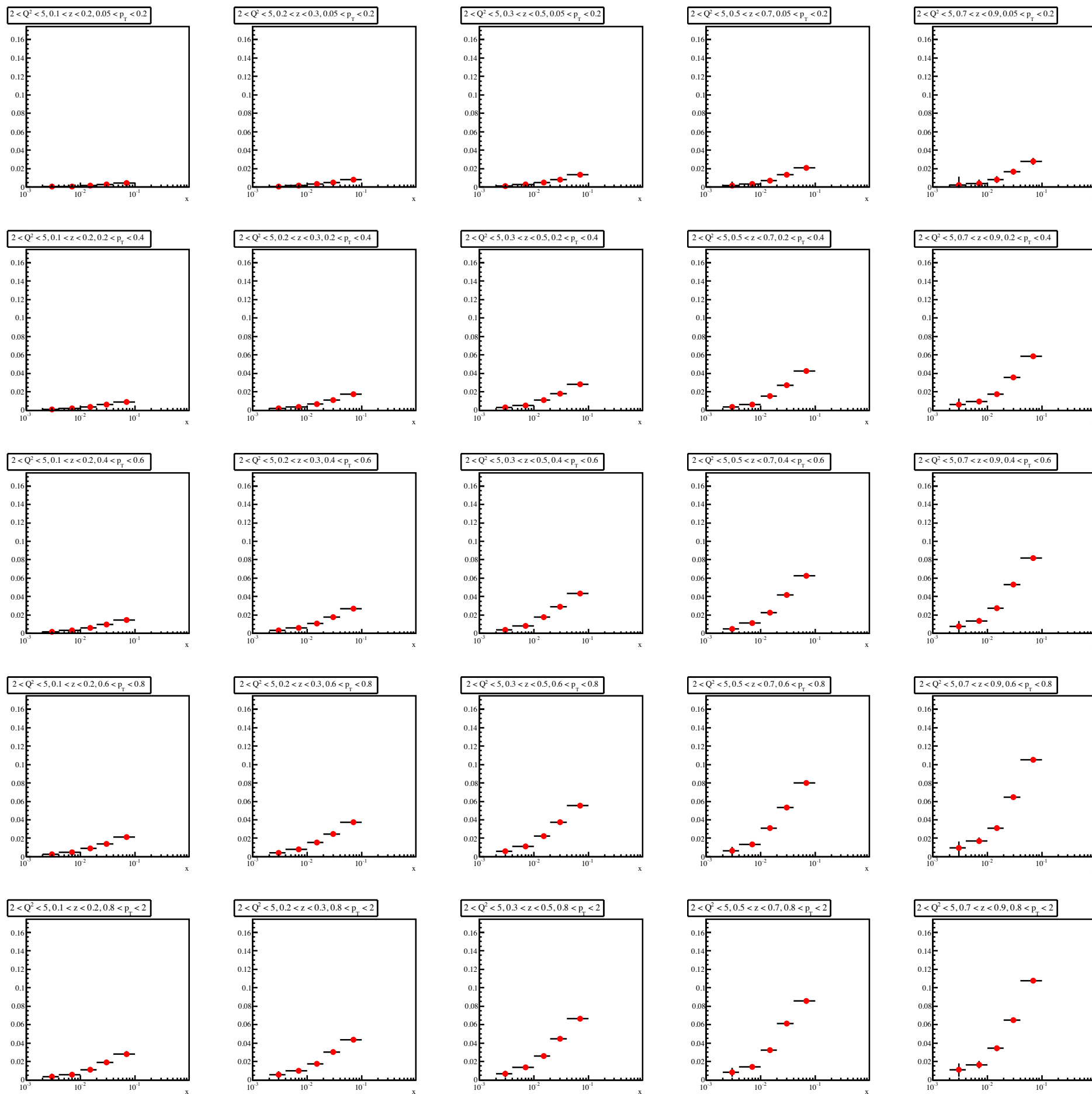
π^+ @ 5 x 50

π^+ @
5 x 50
 $1 < Q^2 < 2$



0.17
10⁻³ to 1

π^+ @
5 x 50
 $2 < Q^2 < 5$



$0.005 < p_T < 0.2$

$0.2 < p_T < 0.4$

$0.4 < p_T < 0.6$

$0.6 < p_T < 0.8$

$0.8 < p_T < 2$

0.17
 10^{-3} to 1

$0.1 < z < 0.2$

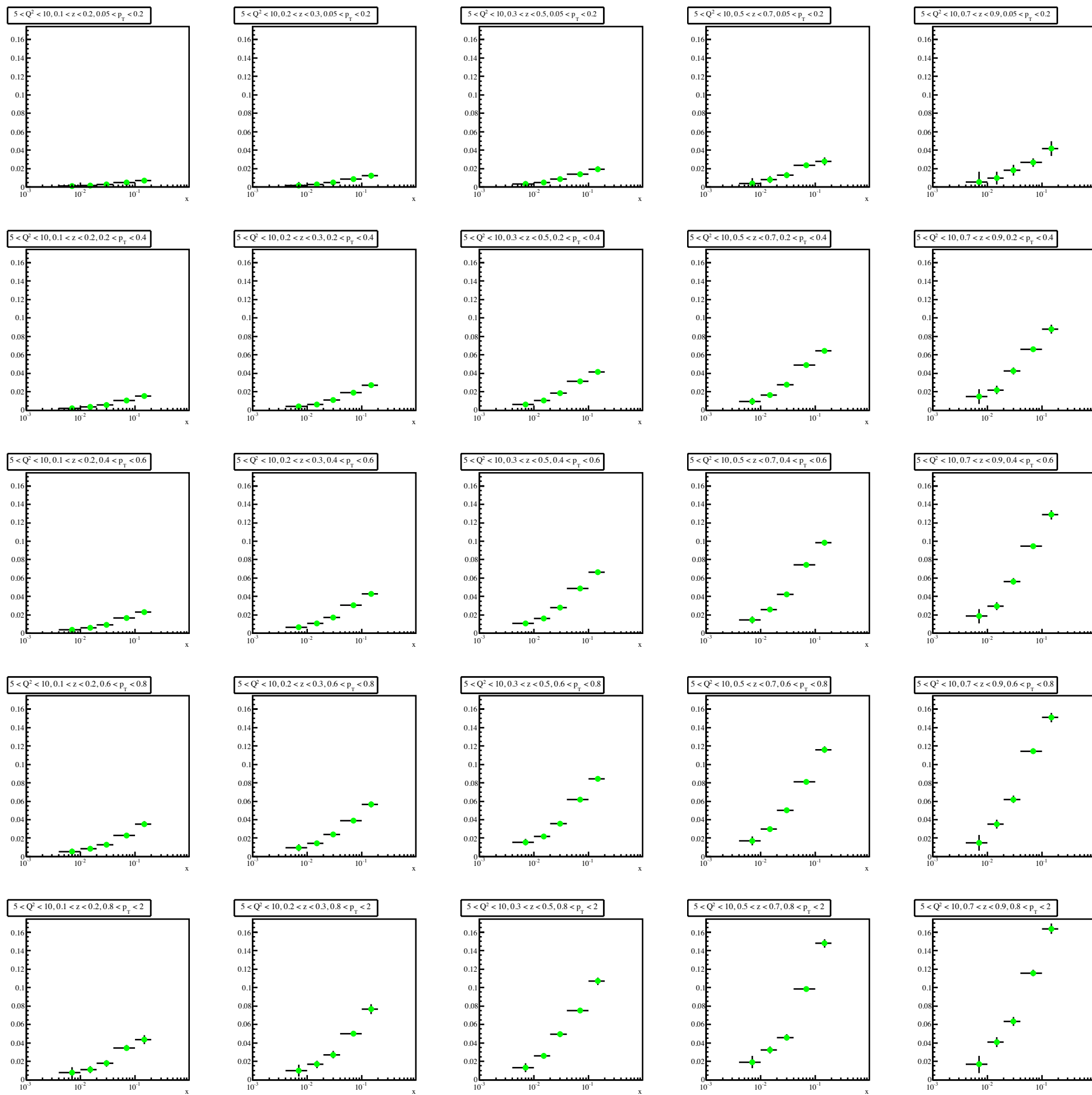
$0.2 < z < 0.3$

$0.3 < z < 0.5$

$0.5 < z < 0.7$

$0.7 < z < 0.9$

$\pi^+ @$
 5×50
 $5 < Q^2 < 10$



$0.005 < p_T < 0.2$

$0.2 < p_T < 0.4$

$0.4 < p_T < 0.6$

$0.6 < p_T < 0.8$

$0.8 < p_T < 2$

0.17

10^{-3} to 1

$0.1 < z < 0.2$

$0.2 < z < 0.3$

$0.3 < z < 0.5$

$0.5 < z < 0.7$

$0.7 < z < 0.9$

K⁺ @ 5 x 50

$$1 < Q^2 < 2$$

0.005 < p_T < 0.2

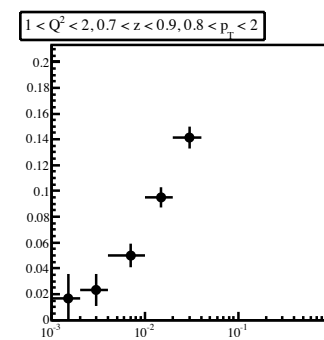
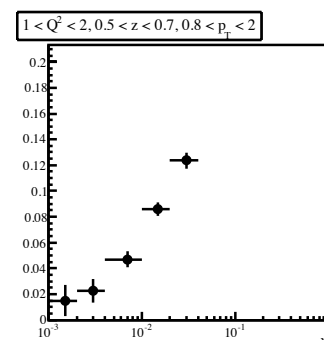
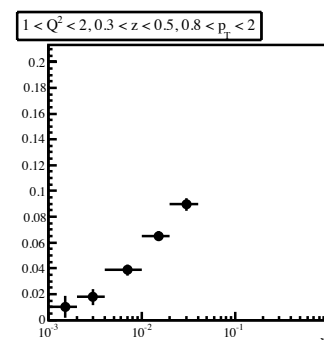
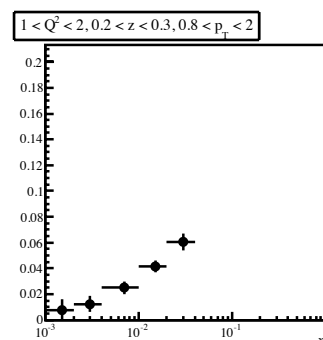
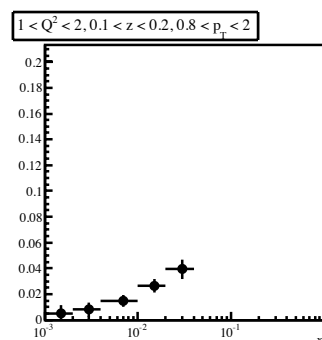
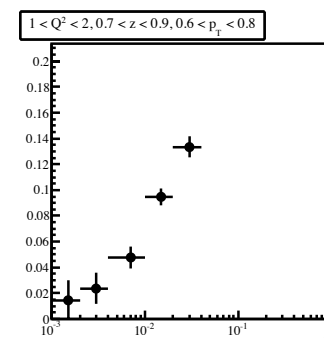
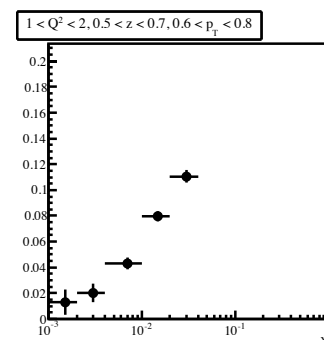
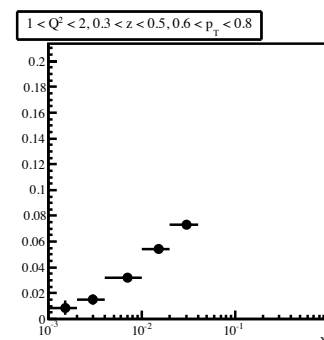
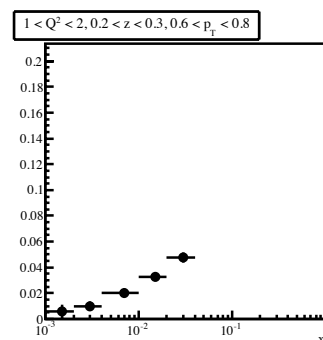
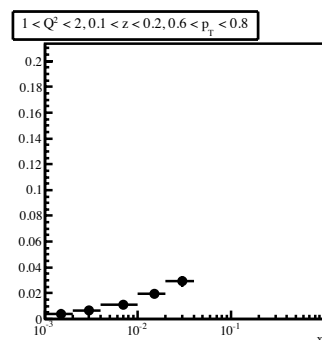
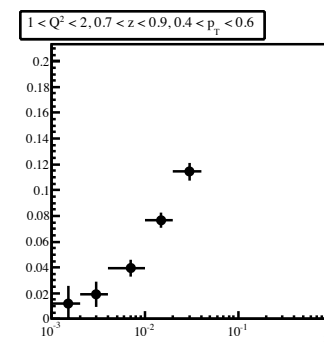
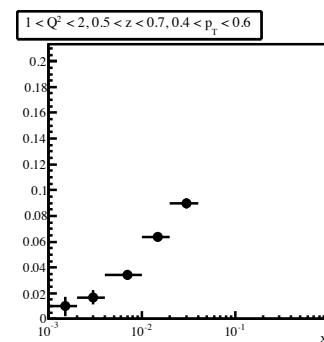
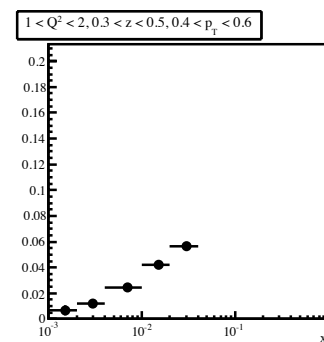
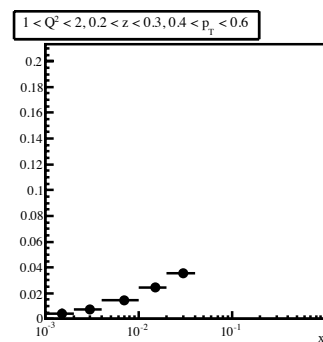
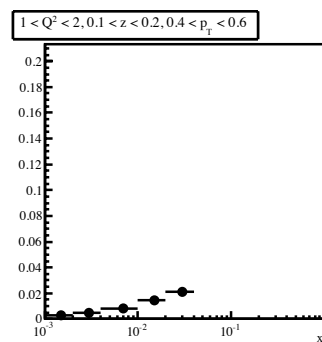
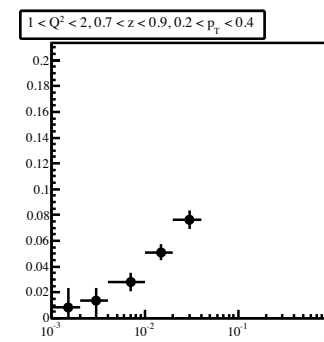
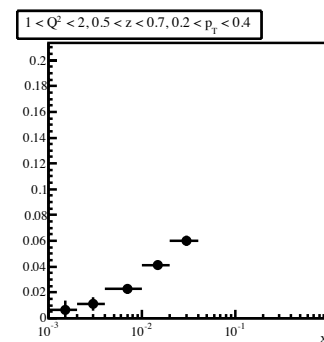
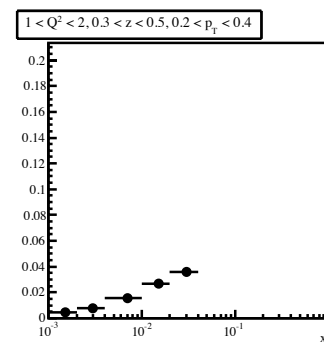
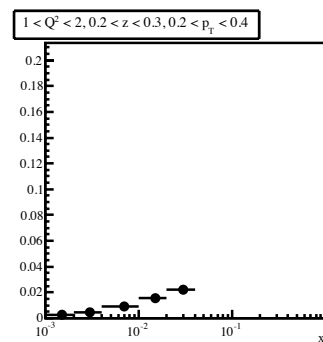
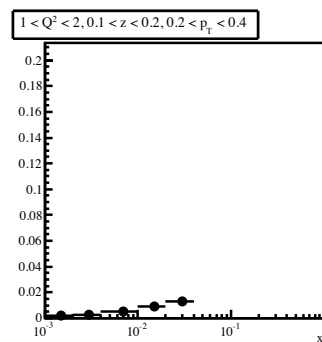
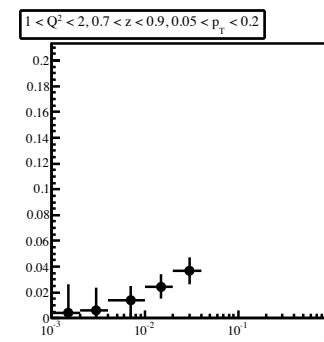
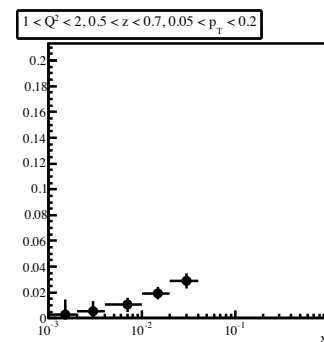
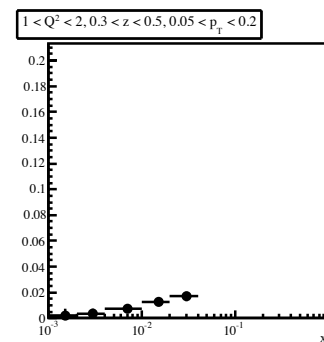
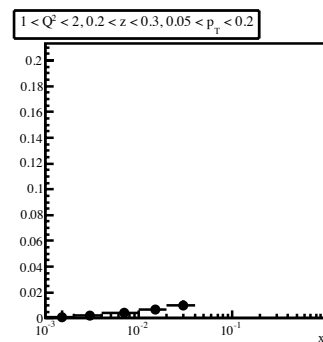
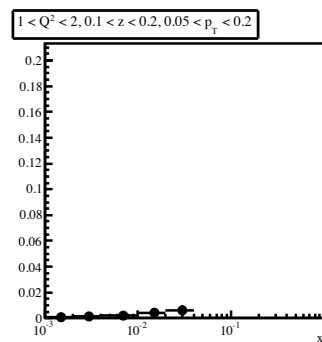
0.2 < p_T < 0.4

0.4 < p_T < 0.6

0.6 < p_T < 0.8

0.8 < p_T < 2

0.21
10⁻³ to 1



0.1 < z < 0.2

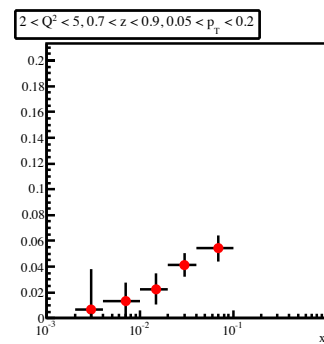
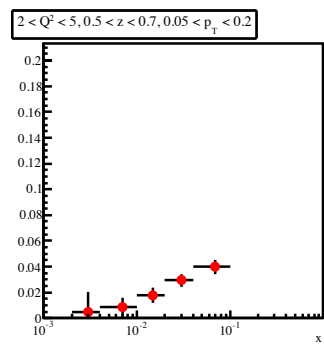
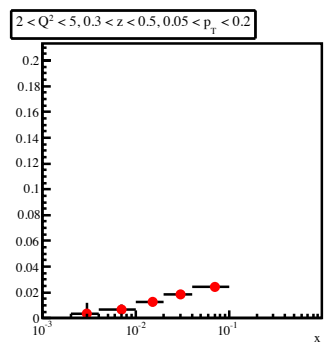
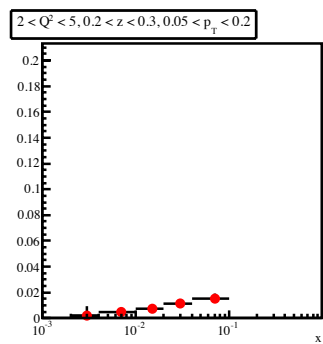
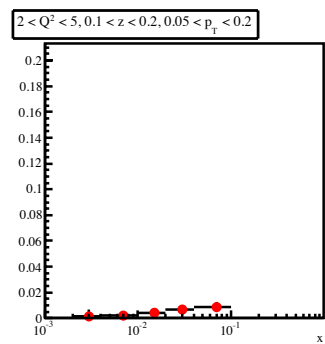
0.2 < z < 0.3

0.3 < z < 0.5

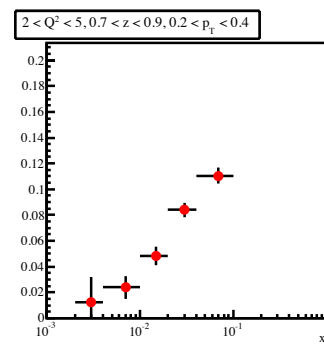
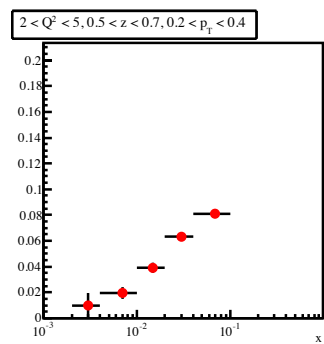
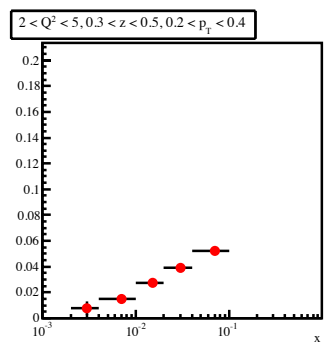
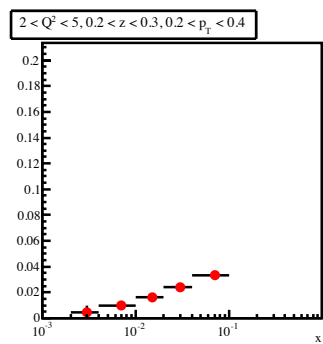
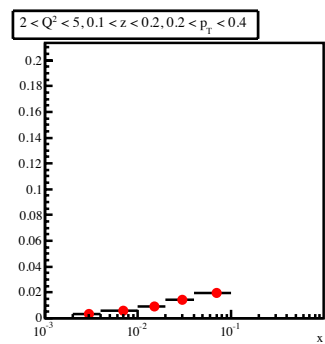
0.5 < z < 0.7

0.7 < z < 0.9

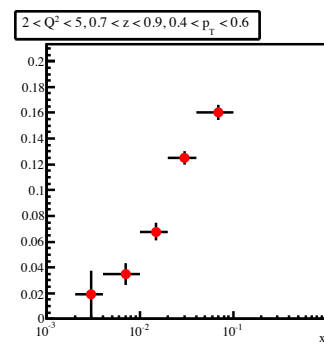
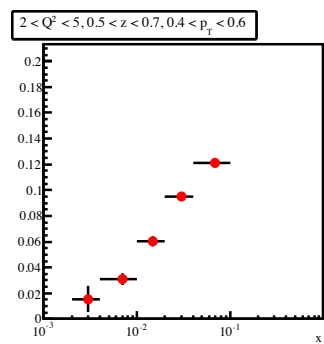
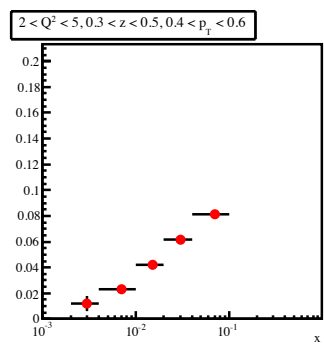
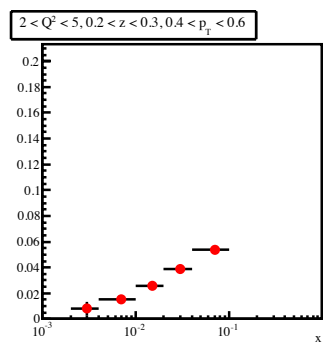
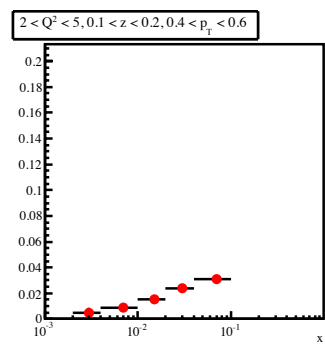
$$2 < Q^2 < 5$$



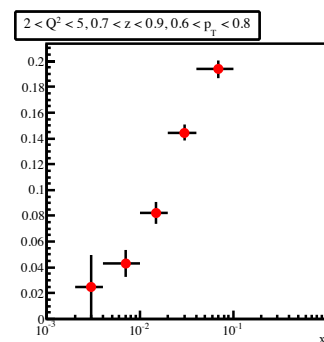
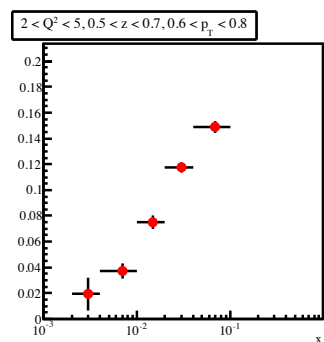
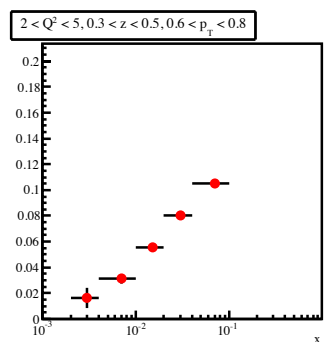
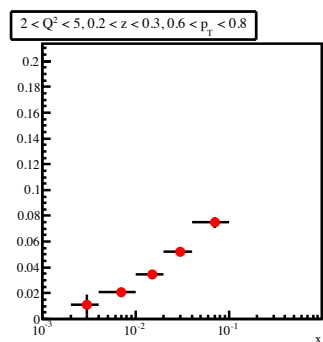
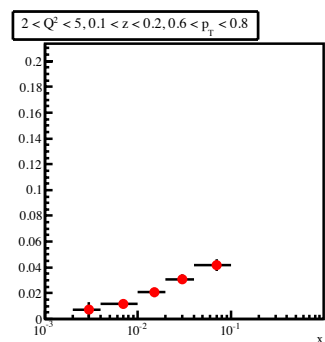
0.005 < p_T < 0.2



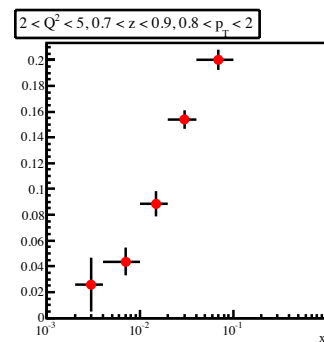
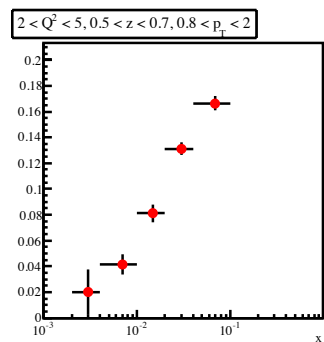
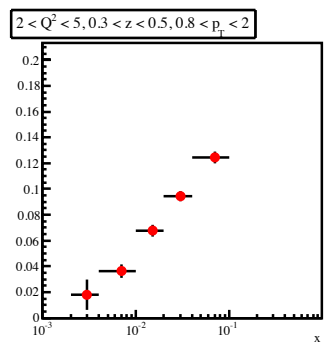
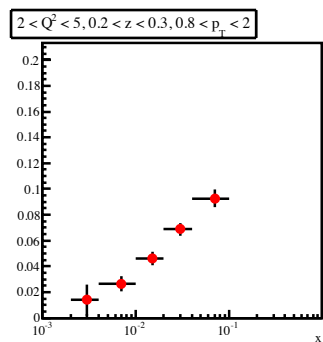
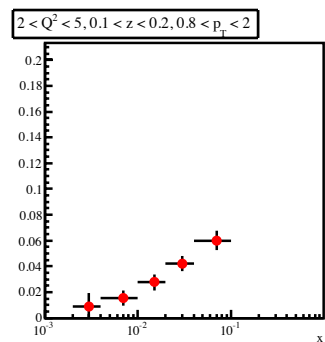
0.2 < p_T < 0.4



0.4 < p_T < 0.6



0.6 < p_T < 0.8



0.8 < p_T < 2

0.1 < z < 0.2

0.2 < z < 0.3

0.3 < z < 0.5

0.5 < z < 0.7

0.7 < z < 0.9

0.21
10⁻³ to 1

$$5 < Q^2 < 10$$

0.005 < p_T < 0.2

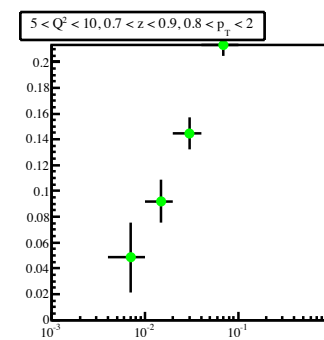
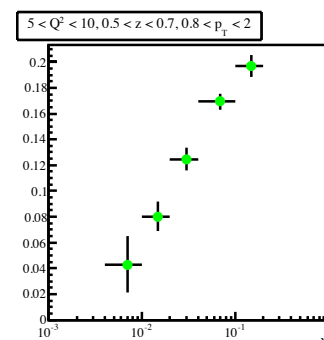
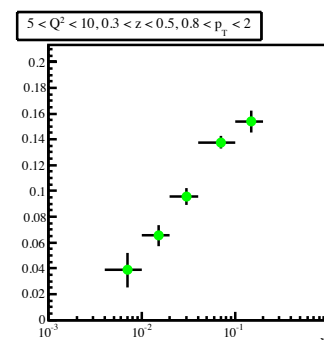
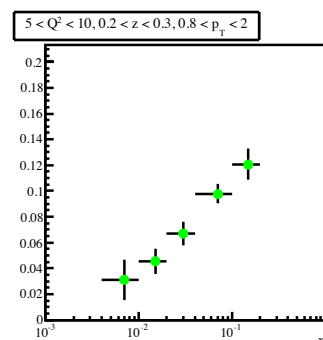
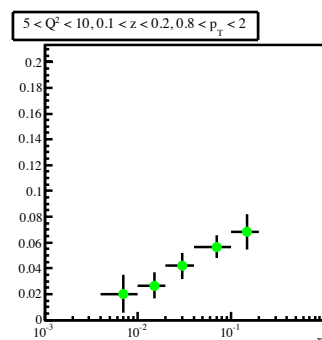
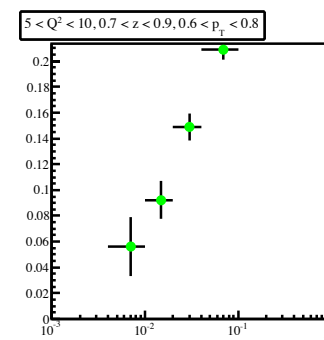
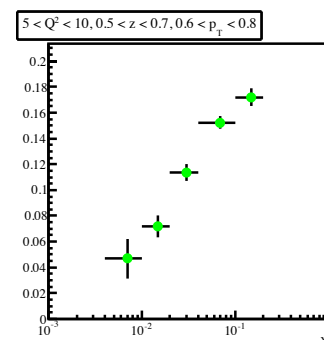
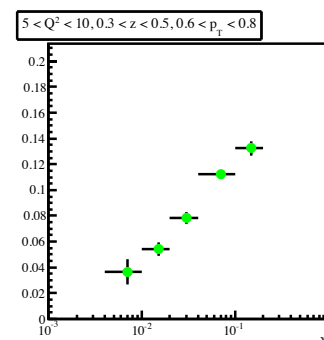
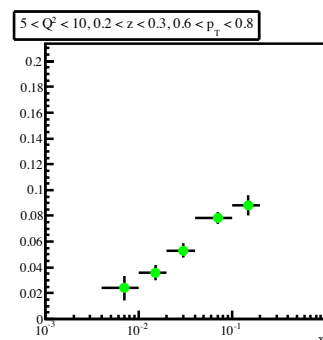
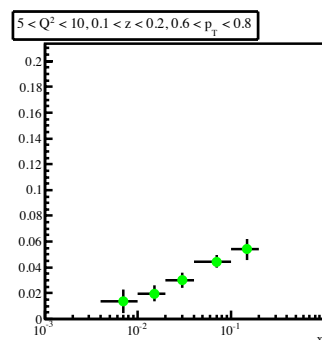
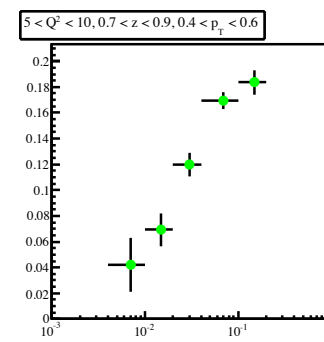
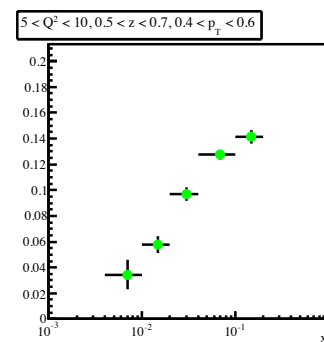
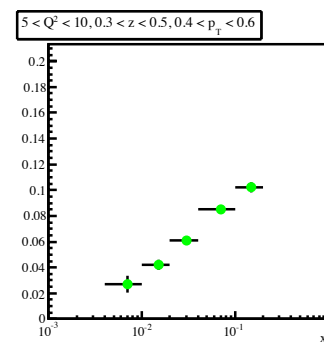
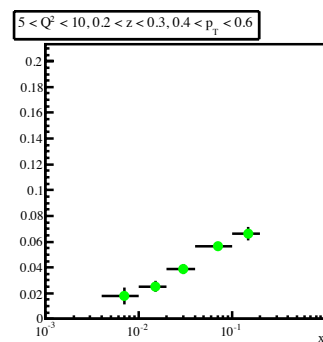
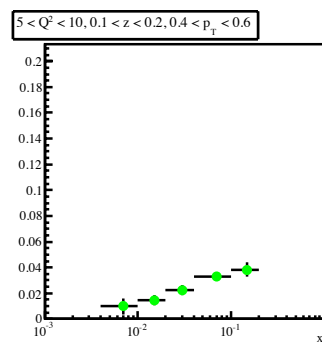
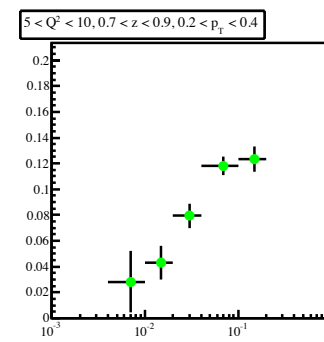
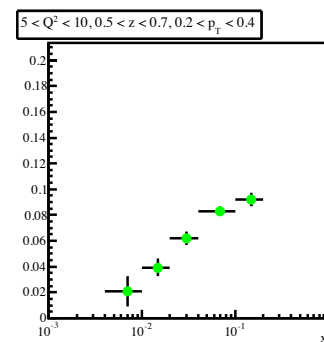
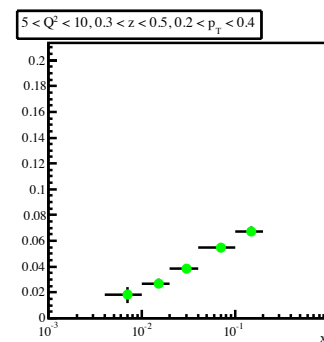
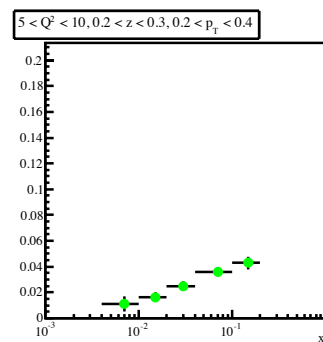
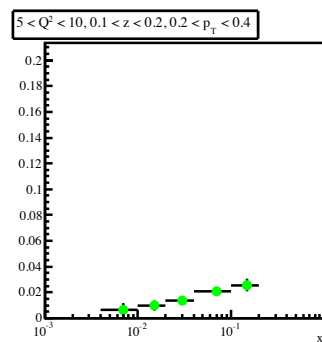
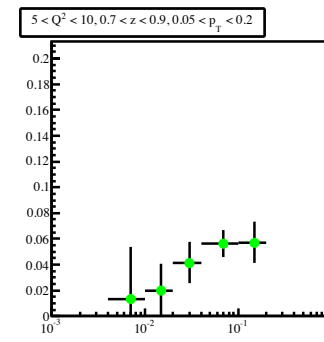
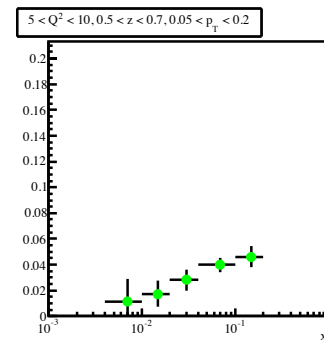
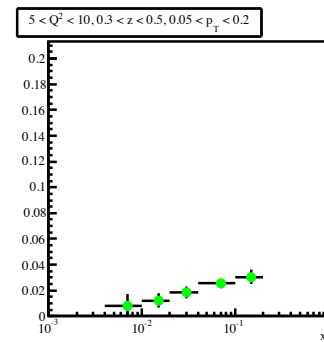
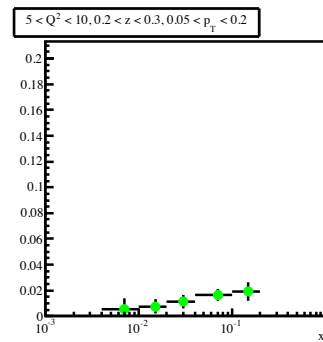
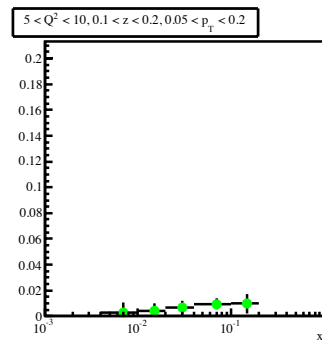
0.2 < p_T < 0.4

0.4 < p_T < 0.6

0.6 < p_T < 0.8

0.8 < p_T < 2

0.21
10⁻³ to 1



0.1 < z < 0.2

0.2 < z < 0.3

0.3 < z < 0.5

0.5 < z < 0.7

0.7 < z < 0.9

π^+ @ 20 x 250

$$1 < Q^2 < 2$$

0.005 < p_T < 0.2

0.2 < p_T < 0.4

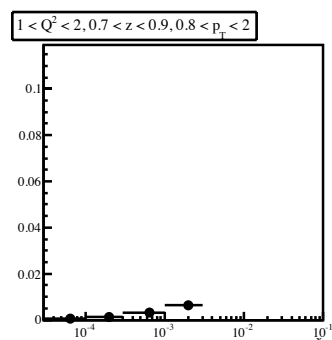
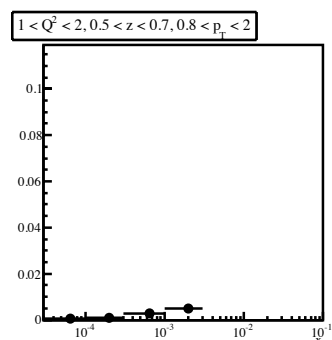
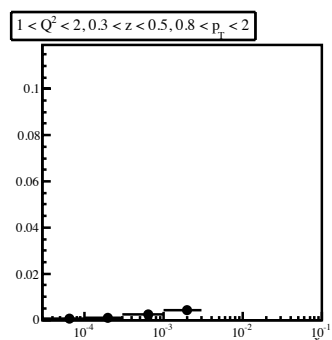
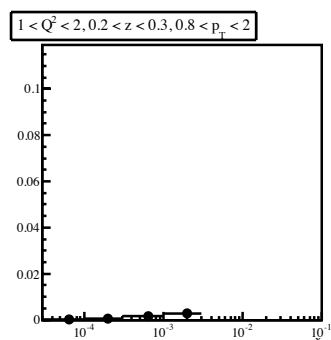
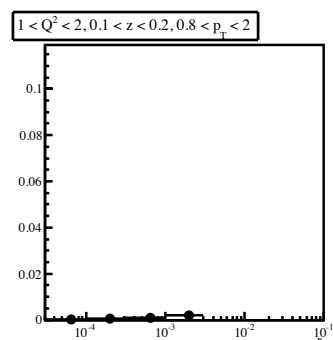
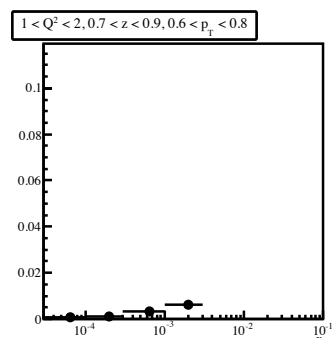
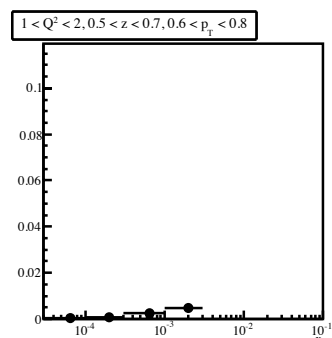
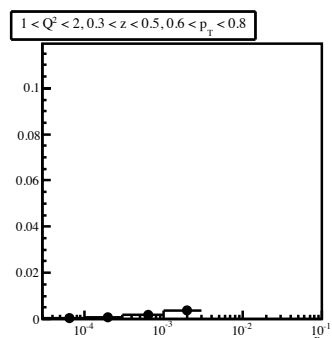
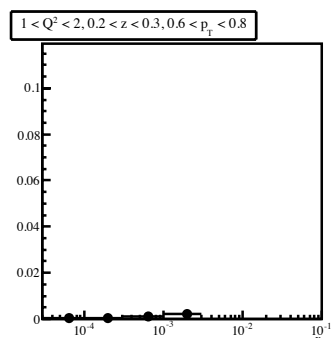
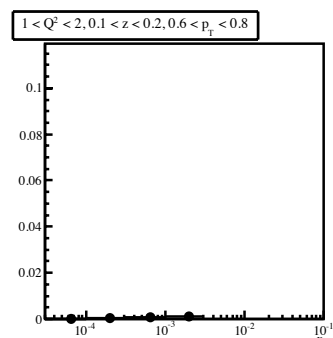
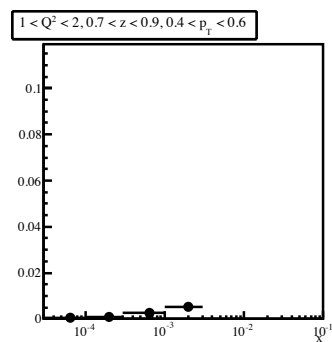
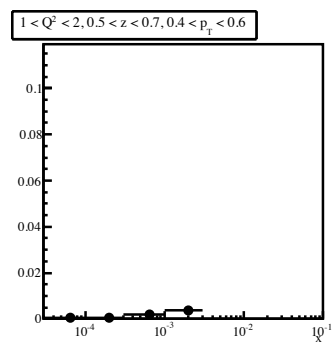
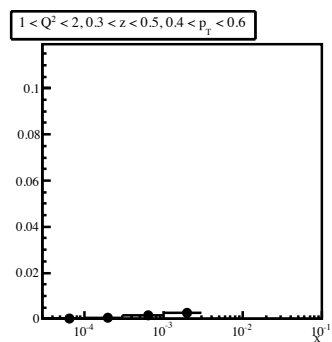
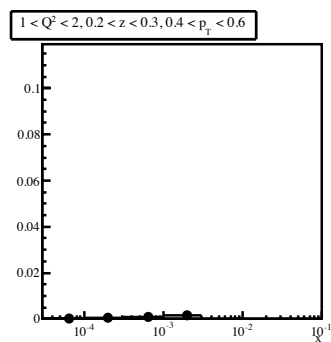
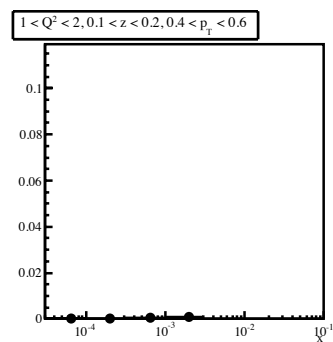
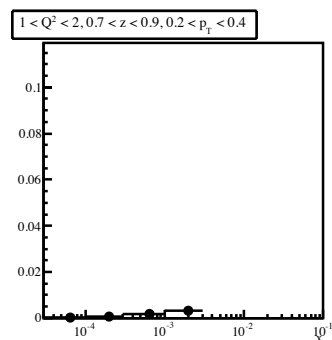
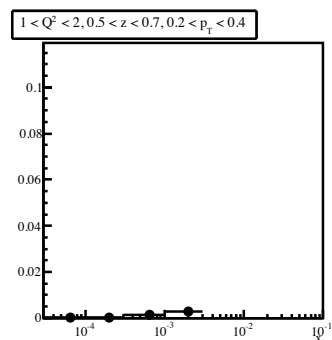
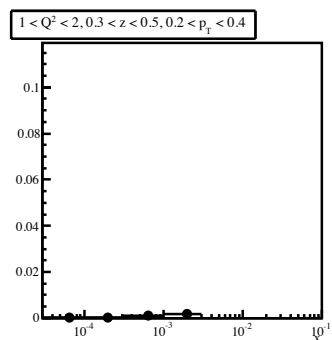
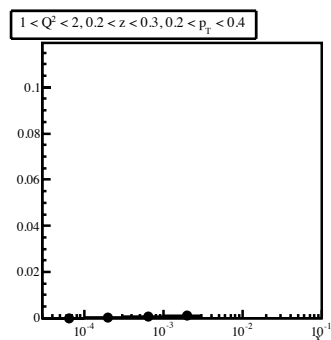
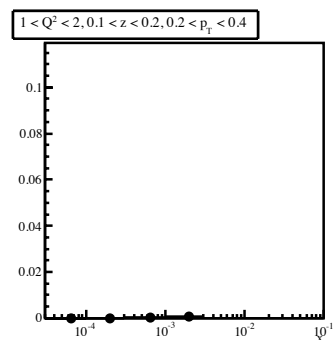
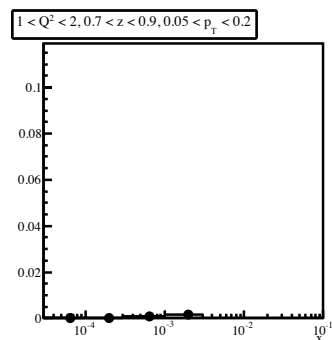
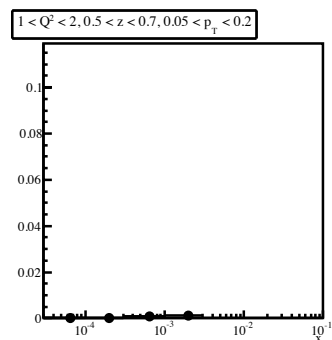
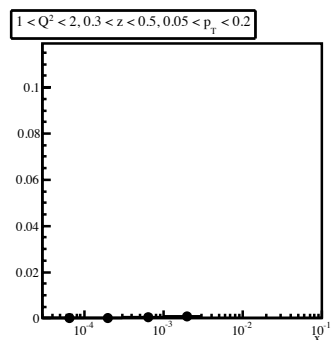
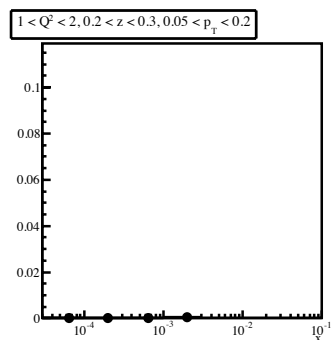
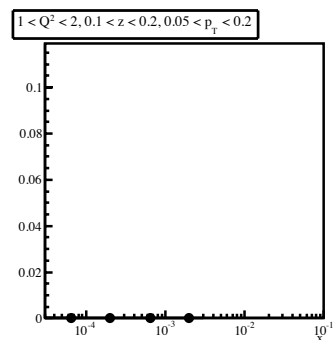
0.4 < p_T < 0.6

0.6 < p_T < 0.8

0.8 < p_T < 2

0.12

3.10⁻⁵ to 0.1



0.1 < z < 0.2

0.2 < z < 0.3

0.3 < z < 0.5

0.5 < z < 0.7

0.7 < z < 0.9

$$2 < Q^2 < 5$$

0.005 < p_T < 0.2

0.2 < p_T < 0.4

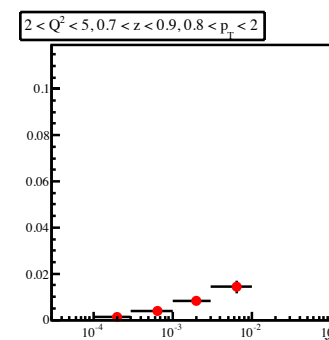
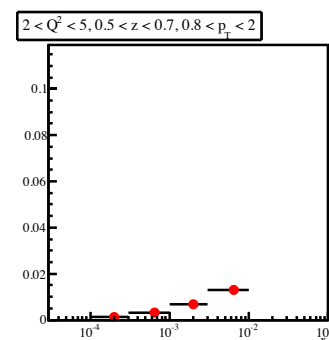
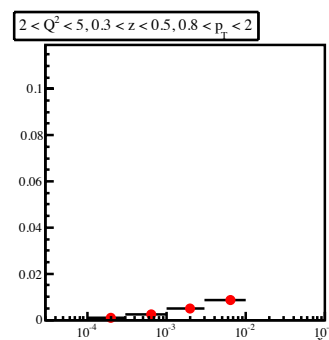
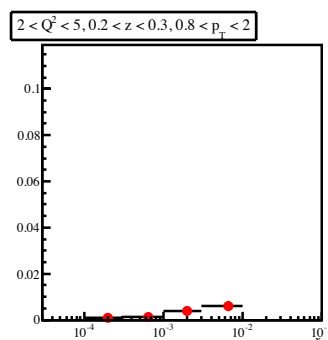
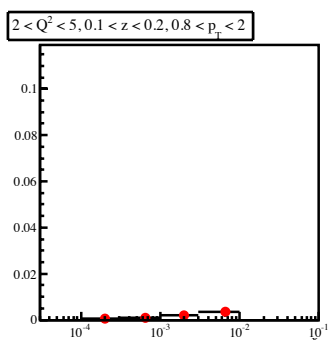
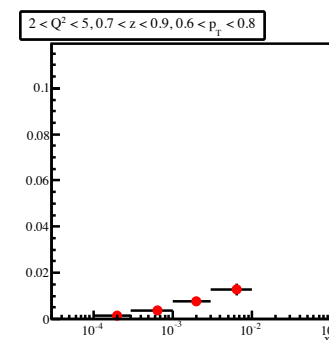
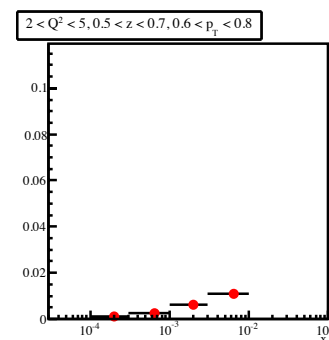
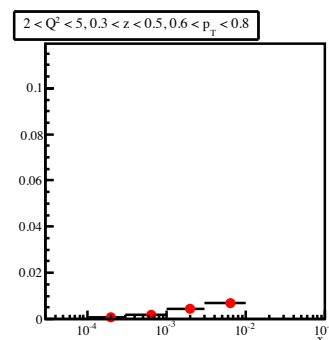
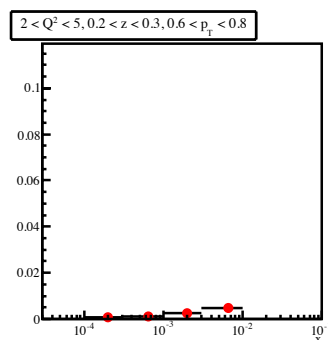
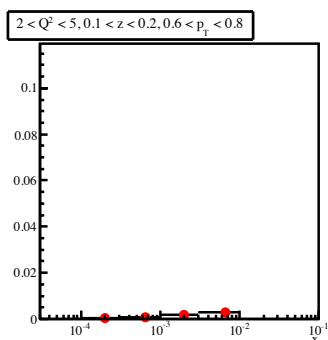
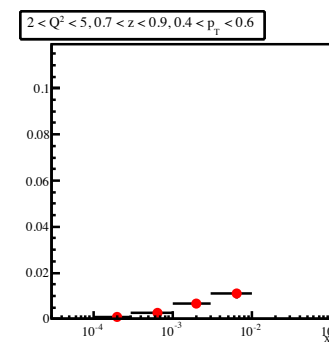
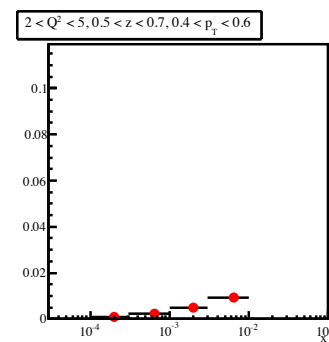
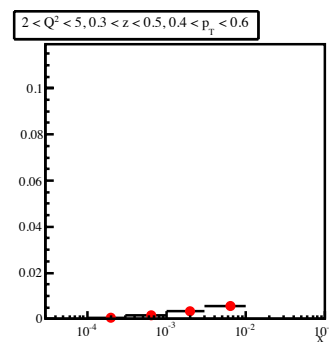
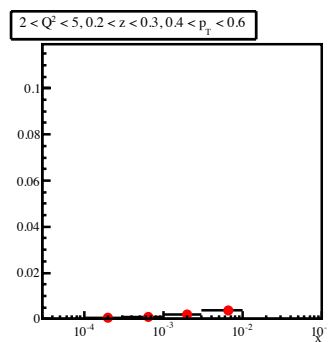
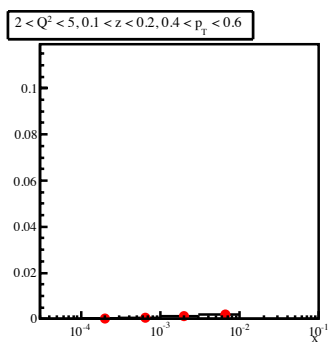
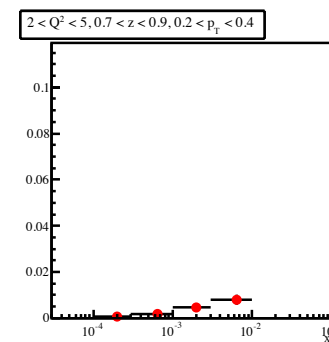
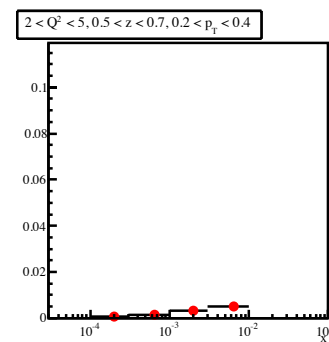
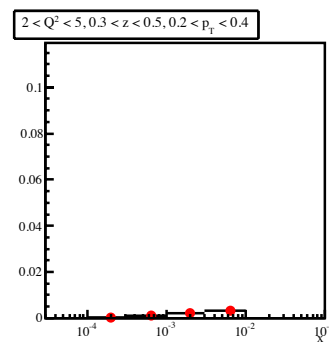
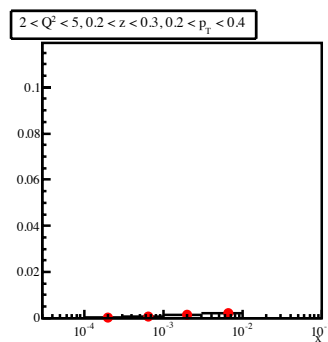
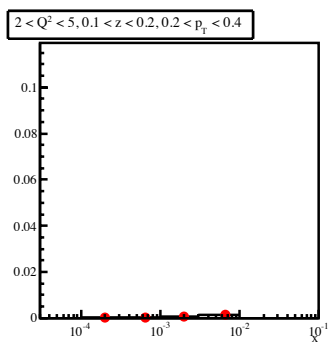
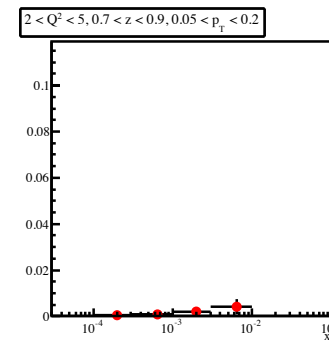
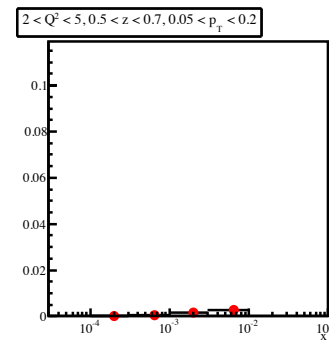
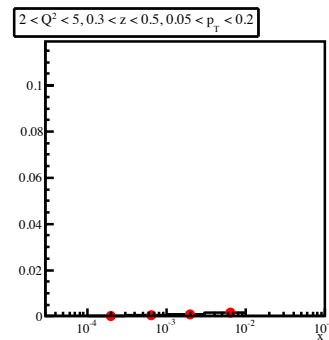
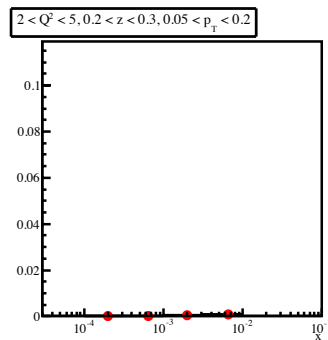
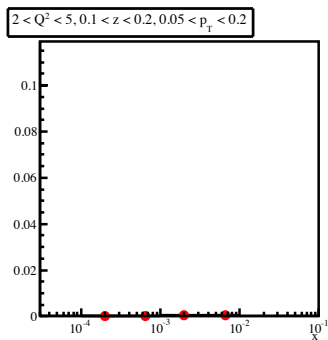
0.4 < p_T < 0.6

0.6 < p_T < 0.8

0.8 < p_T < 2

0.12

3.10⁻⁵ to 0.1



0.1 < z < 0.2

0.2 < z < 0.3

0.3 < z < 0.5

0.5 < z < 0.7

0.7 < z < 0.9

$$5 < Q^2 < 10$$

0.005 < p_T < 0.2

0.2 < p_T < 0.4

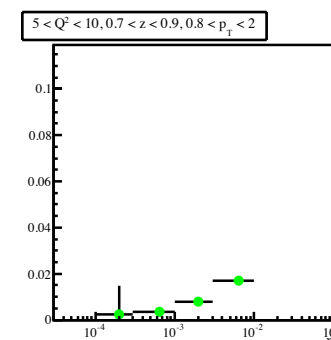
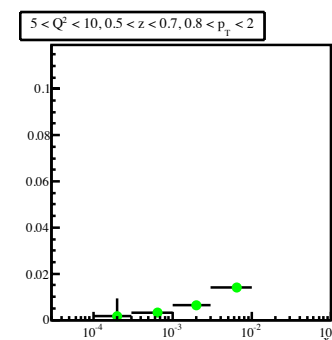
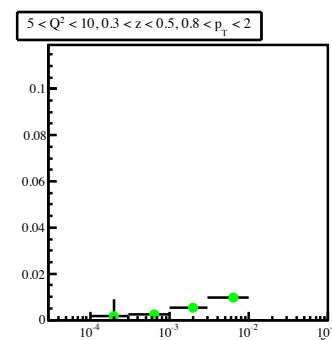
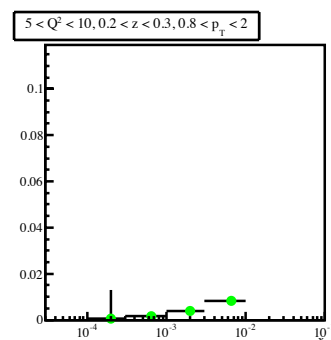
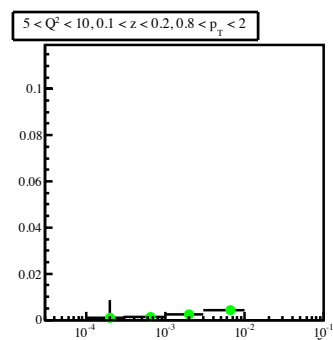
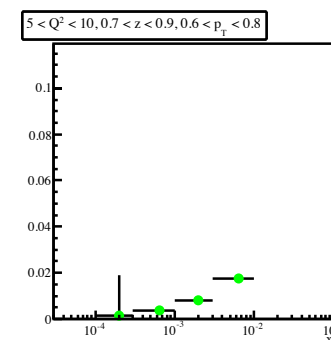
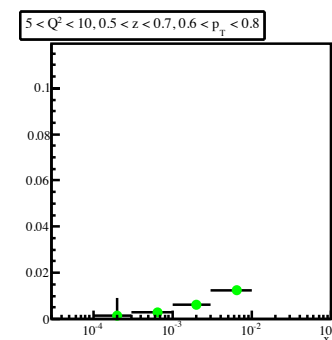
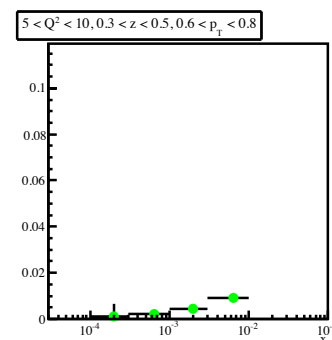
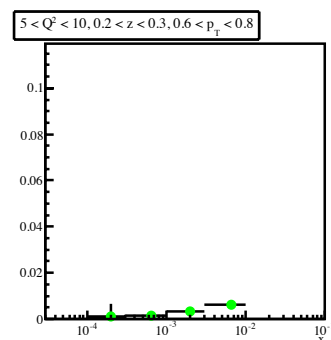
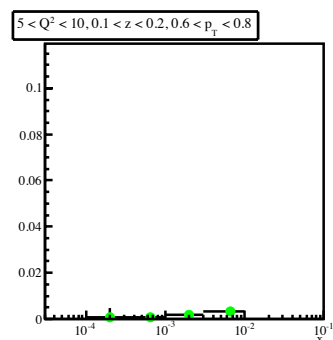
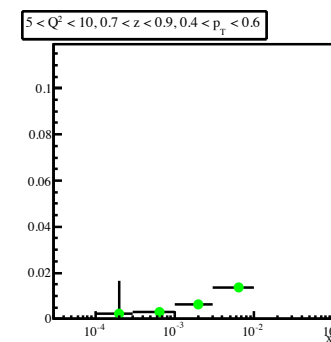
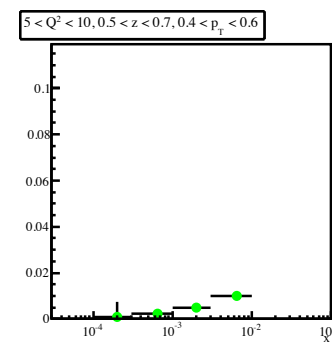
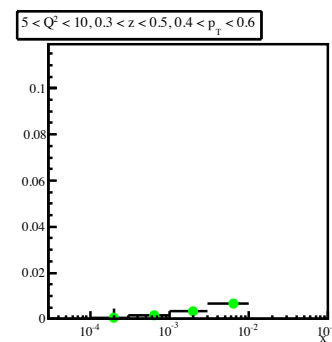
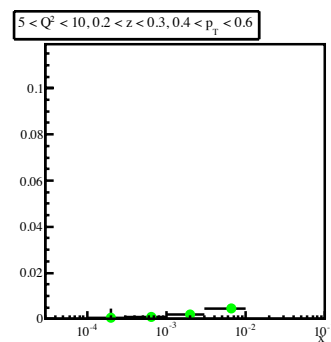
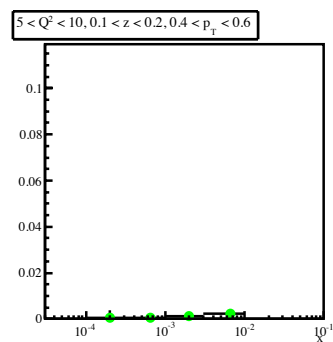
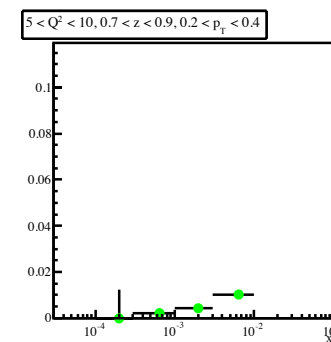
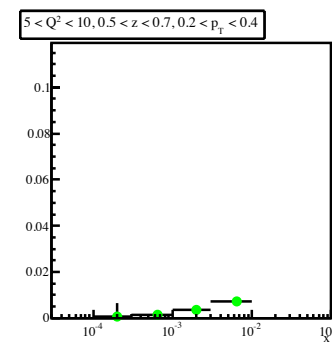
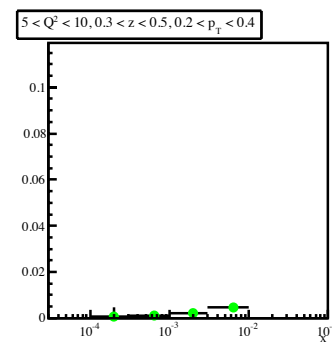
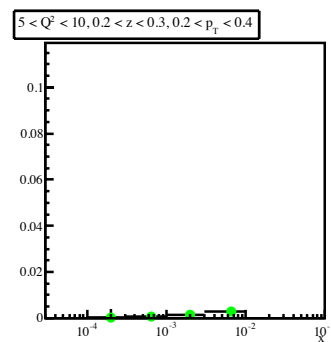
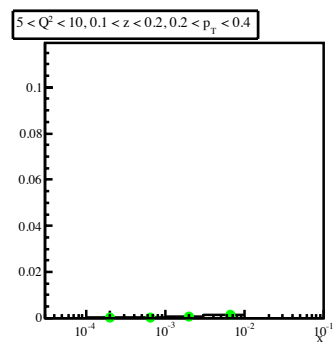
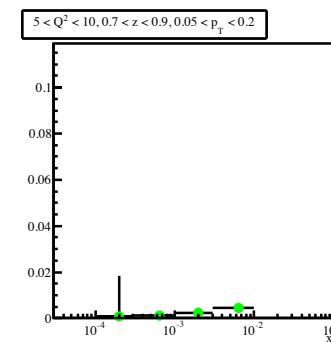
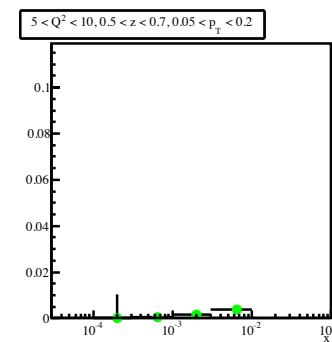
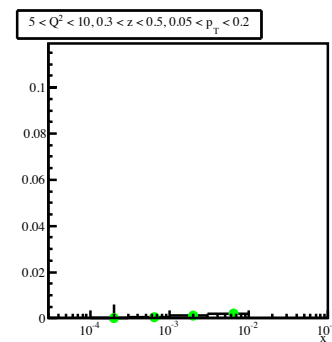
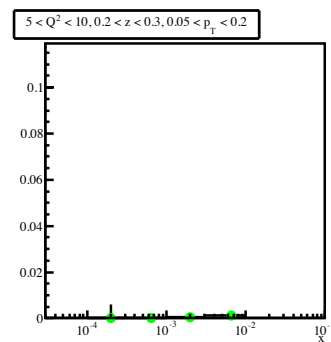
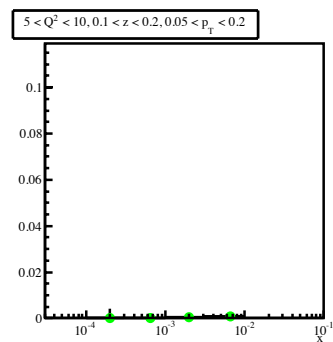
0.4 < p_T < 0.6

0.6 < p_T < 0.8

0.8 < p_T < 2

0.12

3.10⁻⁵ to 0.1



0.1 < z < 0.2

0.2 < z < 0.3

0.3 < z < 0.5

0.5 < z < 0.7

0.7 < z < 0.9

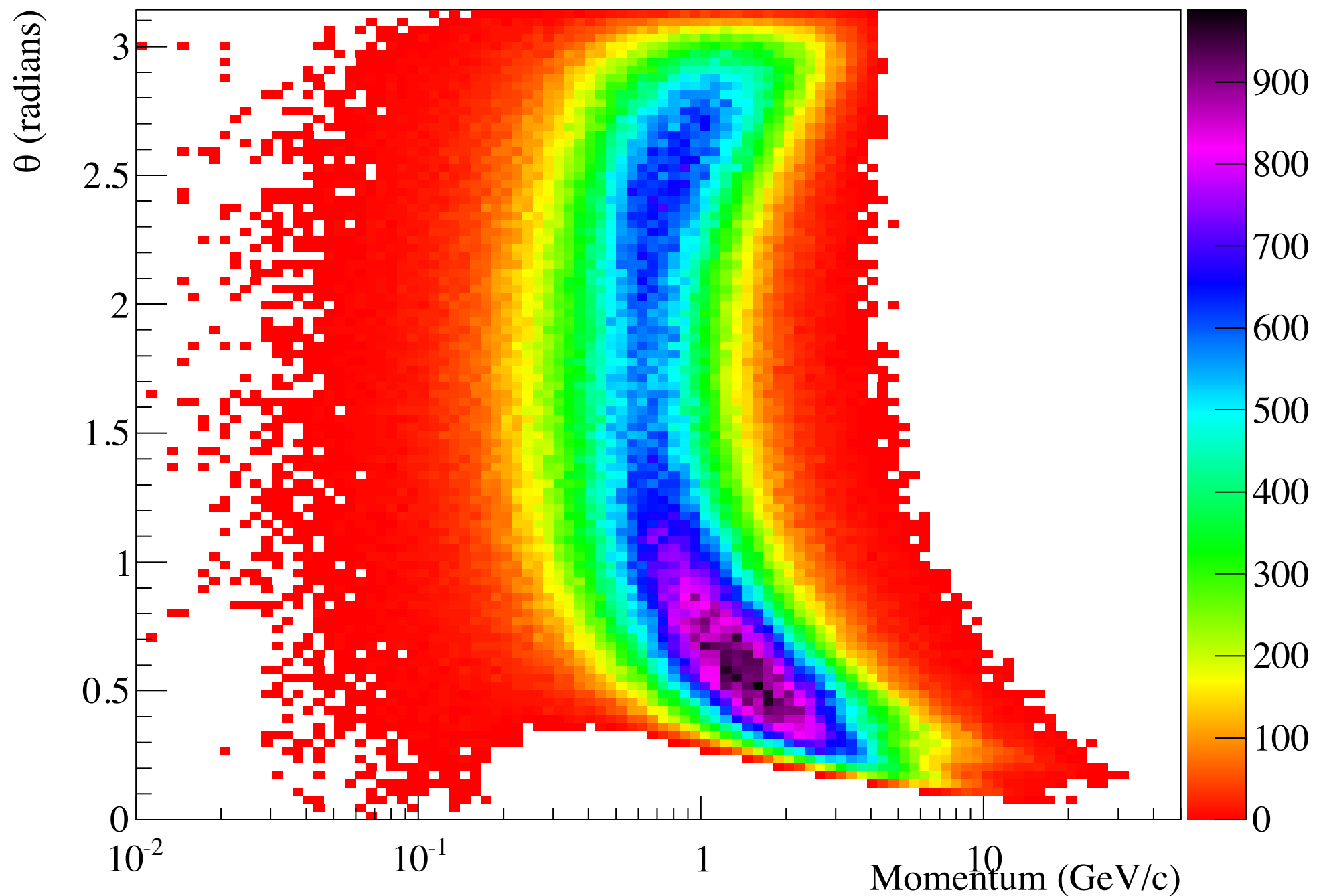
In progress

- Comparisons with JLab Monte Carlo.
- Higher Q^2 .
- Sea quark Sivers: compare zero vs. maximal
 - ▶ What precision is needed to distinguish them?

Hadron acceptance

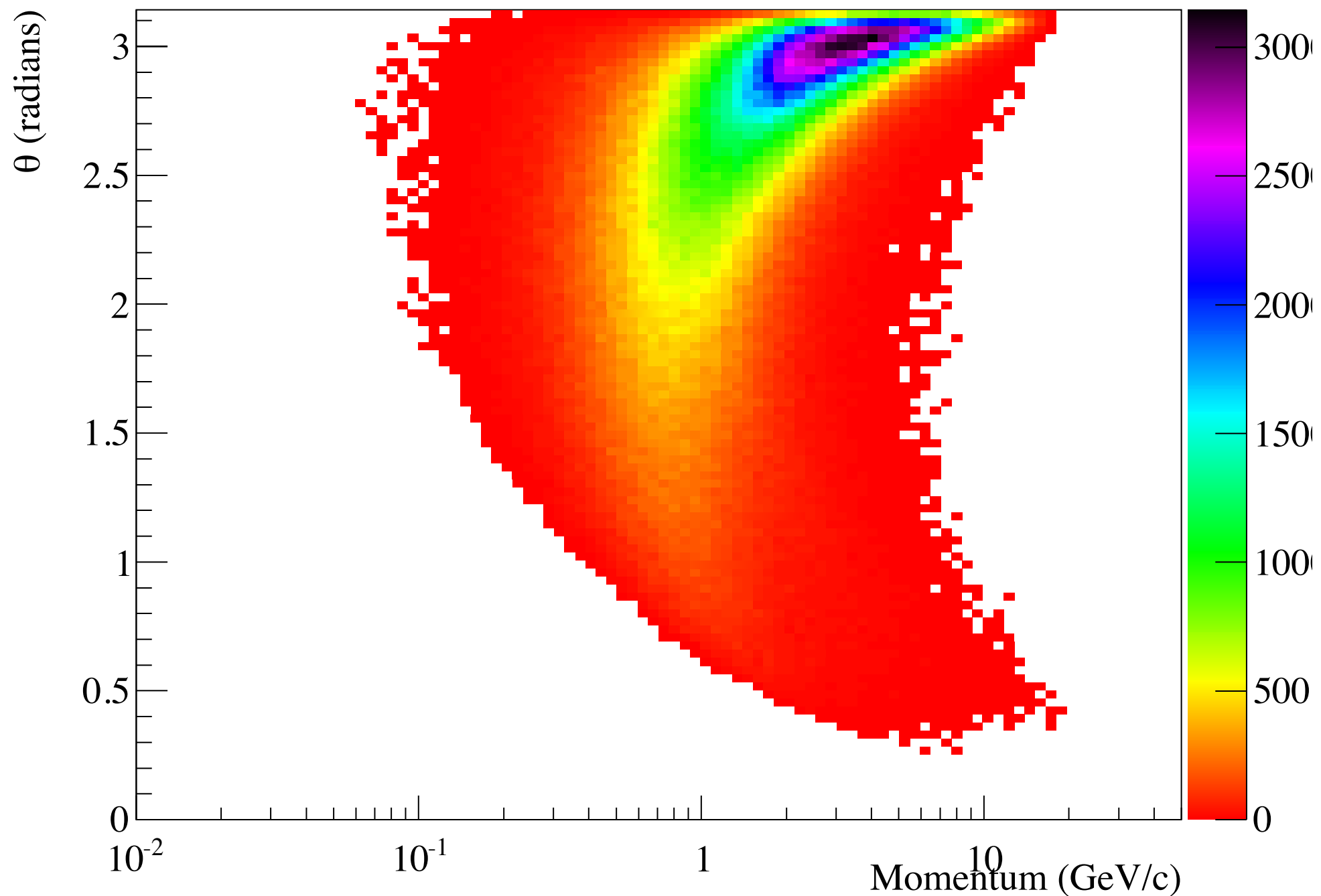
π^+ : θ vs. p @ 5 x 50

θ vs. momentum, π^+

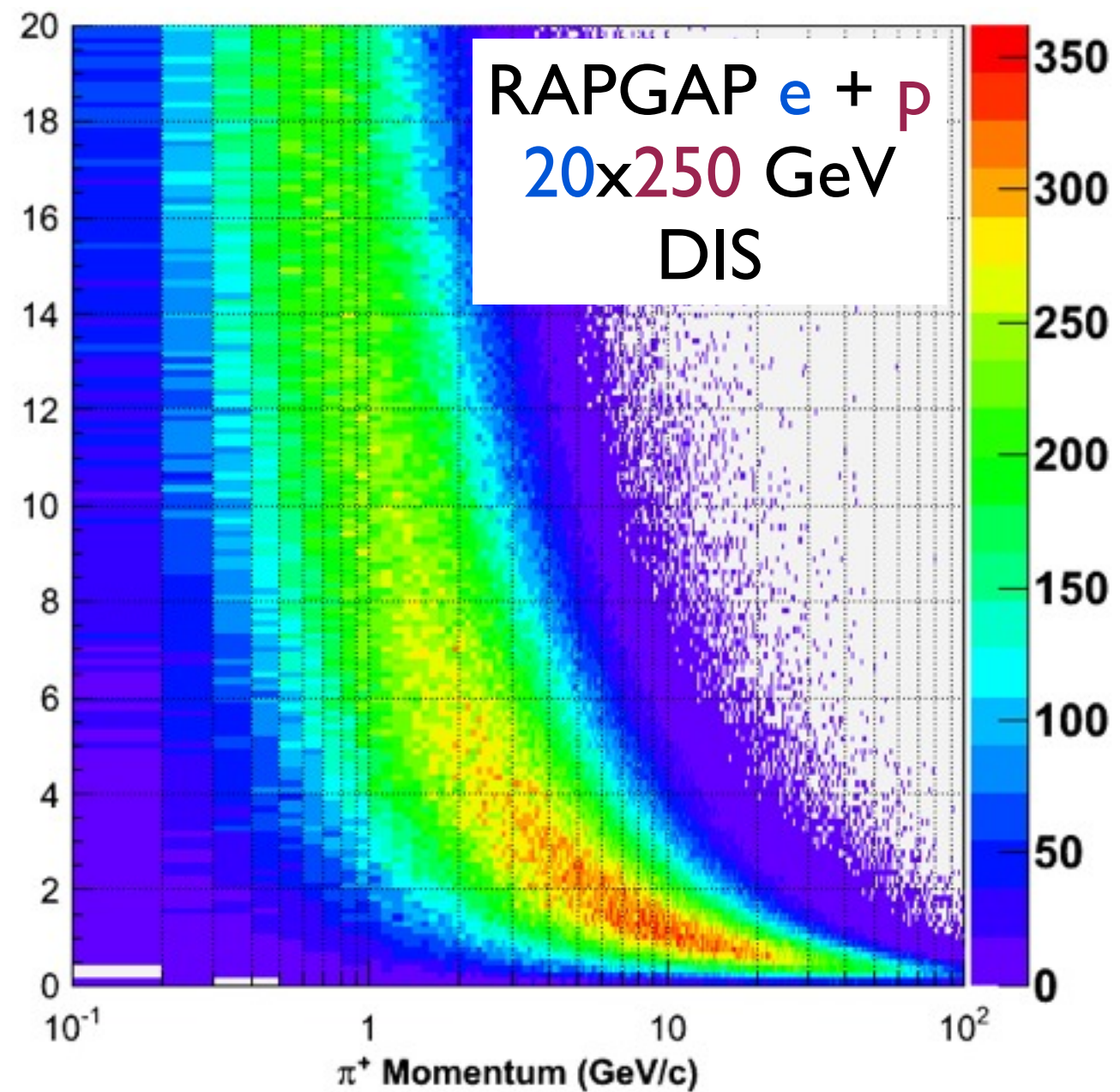
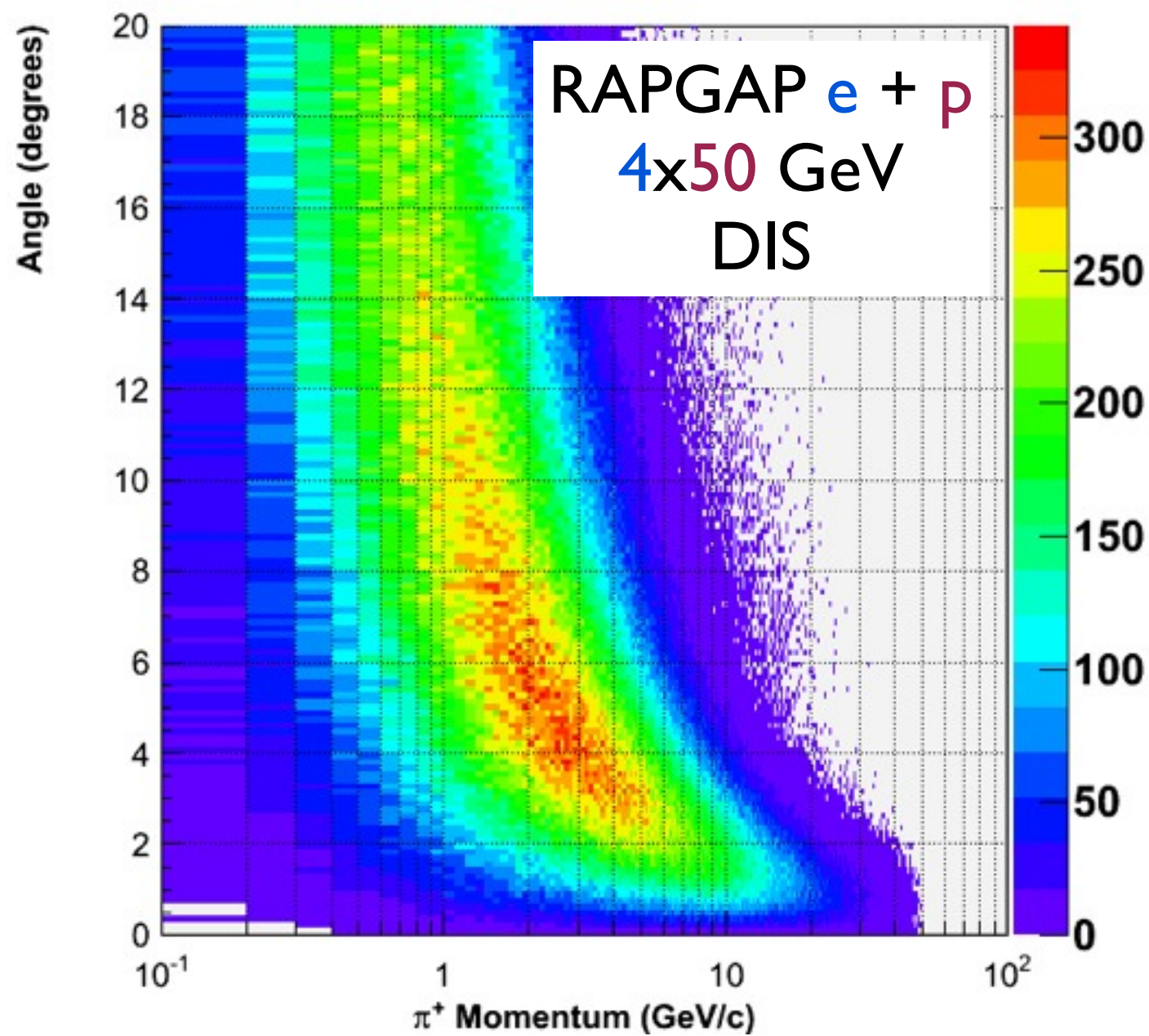


π^+ : θ vs. p @ 20 x 250

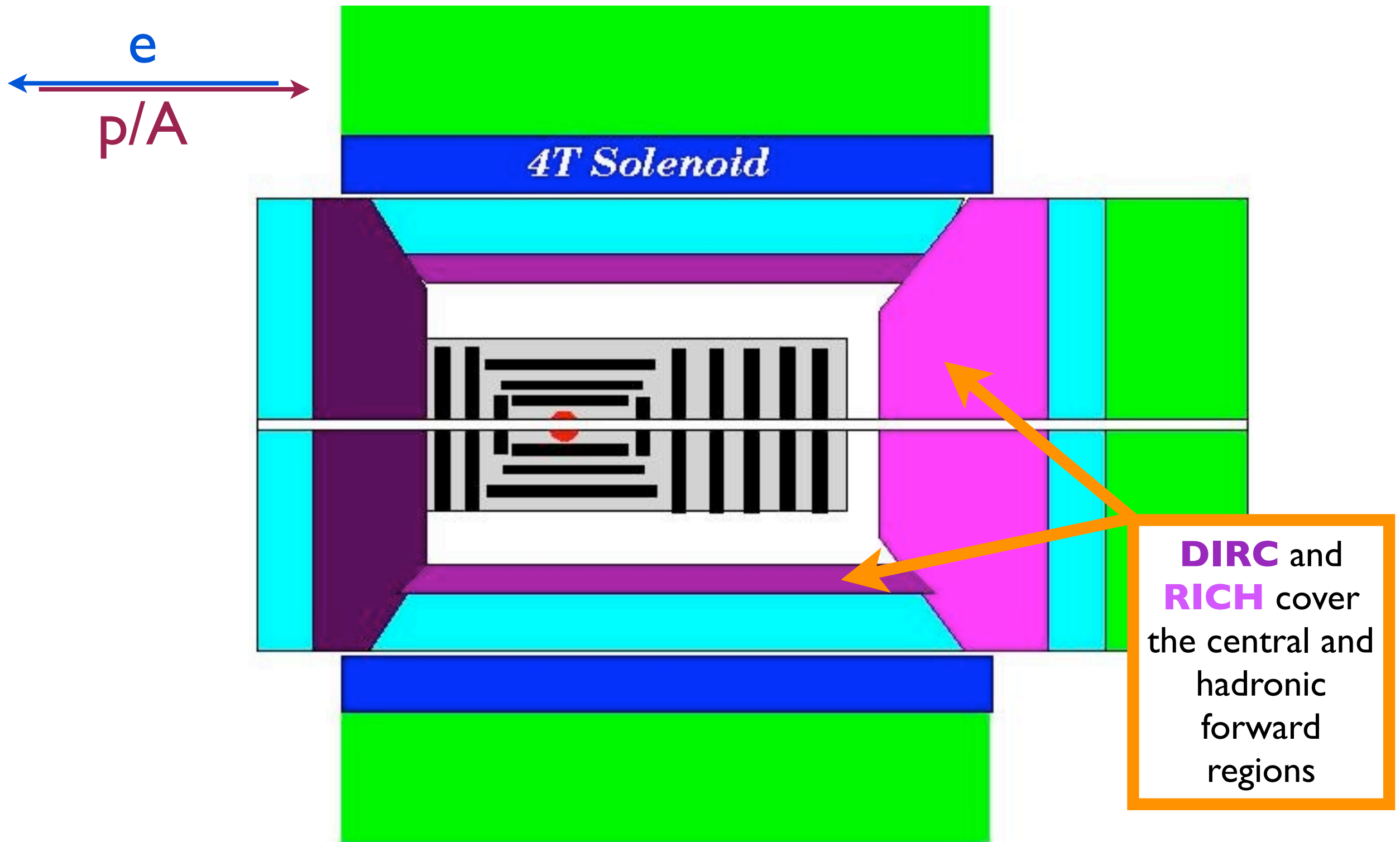
θ vs. momentum, π^+



Where do the produced hadrons go?



Main detector



π^+ : θ vs. p @ 20 x 250

θ vs. momentum, π^+

